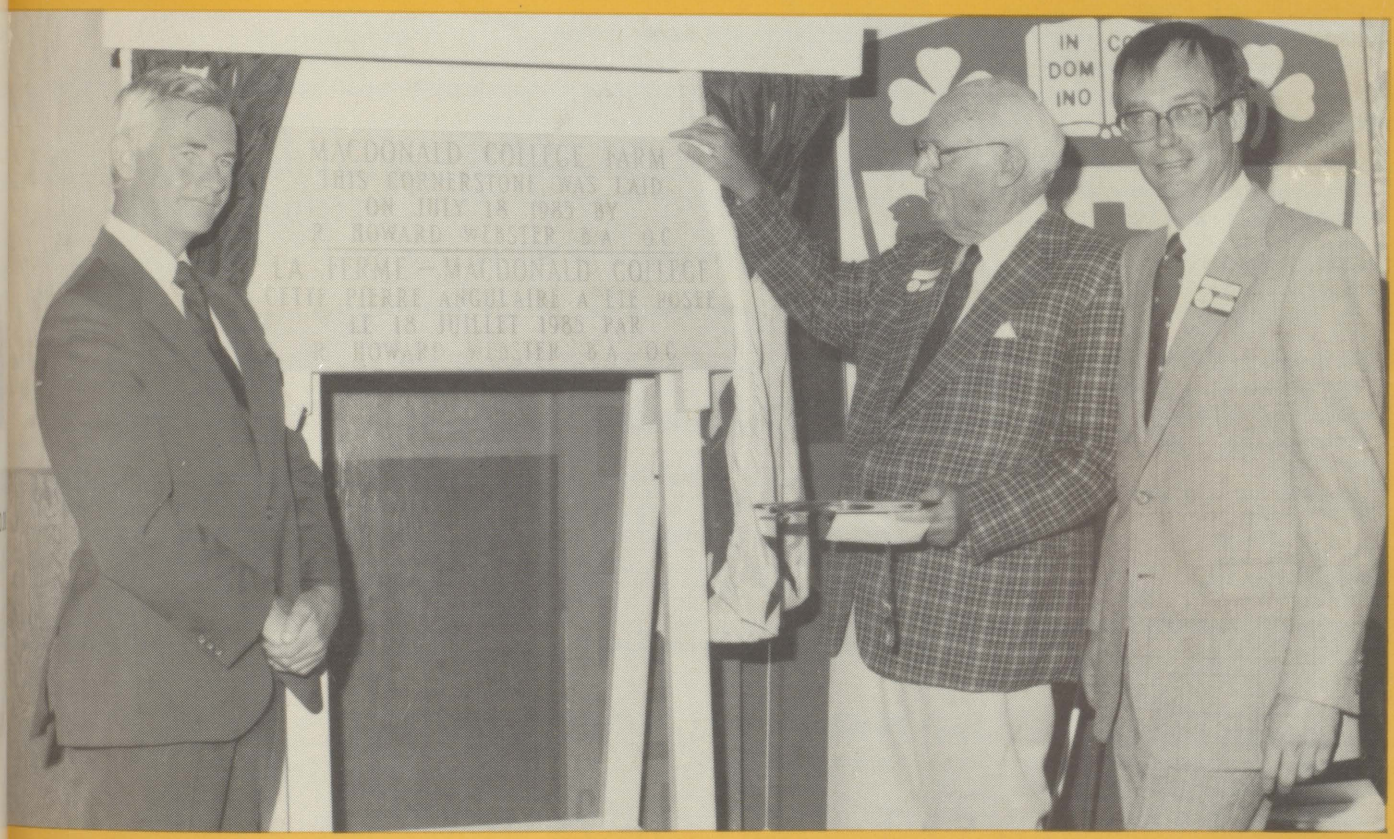
THE MACDONALD JOURNAL

NOVEMBER 1985

MACDONALD COLLEGE LIBRARY
NOV 26 1985



Volume 46, No. 4
November 1985

THE MACDONALD JOURNAL

NOVEMBER 1985

Editor:

Hazel M. Clarke

Publications Committee:

Co-ordinator: Serge Lussier
Laurence Baker
Hazel M. Clarke
Professor Bruce R. Downey
Professor E.R. Norris

Regular Contributors:

Emeritus Professor R.H. Estey
Department of Plant Science
for "Fun Fact Fable Fiction"

Dr. A.F. MacKenzie
Associate Dean, Research
for "Seeking Solutions"

Tom Thompson & Kathy Whitehurst
Martlet House
3605 Mountain St.,
Montreal, Que.
H3G 2M1
for news from the Graduates' Office

Cover Design by:

John Starkey, cover photo by André Virly

The Macdonald Journal is published quarterly (February, May, August, November) by the Macdonald Extension Service of the Faculty of Agriculture of Macdonald College of McGill University.

Material in this issue may be reprinted editorially without permission; however, credit to the Macdonald Journal would be appreciated. Address all inquiries to the Editor, Box 284, Macdonald Journal, Macdonald College, Quebec, H9X 1C0.

Second class registration number 0463.

Subscription rates are $6.00 for one year. Outside Canada — $10.00 for one year.

Printed by Harpell's Cooperative, Gardenvale, Quebec.

This Issue Page

Dedication of new animal science complex 2

Dr. L.E. Phillip discusses the need for a strong link between agribusiness and universities 5

Macdonald welcomed students from Agriculture Canada 9

— one a graduate Russell Knapp 1

Biotechnology and weed control 1

Professor Raghavan describes his success with a particulate medium grain dryer and heat treater 1

Beginning a special section on beef, H.G. Coffin and M. Moisan discuss factors affecting profitability of Quebec feedlots 2

Henry Garino gives his view of the beef situation 2

Rodney MacLaren shares his cow-calf experiences 2

The state of the art in beef production as seen by Orance Mainville 3

Private forestry: Professor Dan MacArthur asks is it for fun or profit? 3

An introduction to the new School of Dietetics and Human Nutrition 3

Must reading! A serious and frank look at the nutritionist in today's society ... 3

Mac Reunion '85 4

Macdonald Woodsmen celebrate their 25th ..... Inside back cover

Features

Seeking Solutions 8

PS 22

Diploma Corner 34

Fun Fact Fable Fiction 36

Newsmakers 44

Cover Story

Guests from the federal, provincial, and municipal governments, business, education, the alumni and other sectors gathered for a special cornerstone unveiling last July for the new animal science complex. The cornerstone was unveiled by McGill benefactor, Howard Webster, who was assisted by Principal Johnston and Dr. Roger Buckland, Vice Principal, Macdonald College. We have a special section on beef in this issue. Our thanks to Henry Garino for co-ordinating this special and to the other contributors, particularly Rodney MacLaren and Orance Mainville. Henry's assistance has not ended with this issue; we have articles planned for both next February and May.

The following organizations or individuals

are

financially sponsoring

The Macdonald Journal

BANK OF MONTREAL

CIBA-GEIGY SEEDS
division of
CIBA-GEIGY CANADA LTD.

INTERNATIONAL STOCK FOOD COMPANY LIMITED

RALSTON PURINA CANADA INC.

Dr. Donald McQueen Shaver
of
SHAVER POULTRY BREEDING FARMS LIMITED

At dedication of new Animal Science Complex

Macdonald Acclaimed for Contribution to Local and World Agriculture

The cornerstone for Macdonald's new animal science complex was unveiled July 18 in a ceremony which launched a major redevelopment of the College Farm. Scheduled for completion in 1990, the new animal complex will occupy some 8,000 square metres — about two acres. It will provide research and teaching facilities, housing dairy and beef cattle, swine, sheep, and poultry.

"These plans represent an ambitious project for the development of the farm area," said Roger Buckland, Dean of the Faculty of Agriculture and McGill Vice-Principal for Macdonald College. "They begin a major restructuring in the Faculty of Agriculture to maximize cooperative teaching and research in all areas."

Space will be allocated in the new complex for a full range of activities — some now dispersed and isolated and some not yet represented in the existing Farm. New cattle facilities will include a dairy barn, calving area, cattle replacement wing, cattle growing area, feedlot, hay barn, silos, feed mixing area, and modern manure handling facilities. The swine complex will have areas for sows, weaning, manure handling, and research, consolidated from the present arrangement, which uses several very old buildings for different areas of swine production and research.

Sheep facilities will be renovated and consolidated. New poultry facilities will be consolidated from seven different buildings and moved into the main farm complex. They will have modern cage areas, environmental rooms, feed storage, incubators, waste handling, and teaching and research facilities. In addition, the complex will include overflow space to house extra animals, a slaughter facility, and a new animal research area to support special physiological studies on domestic animals, including nutrition research.

Federal and provincial government representatives attended the ceremony, praising McGill's leadership and

Pierre Blais, Parliamentary Secretary to Agriculture Canada's Minister John Wise. Photos by Charles Fournier and Hazel M. Clarke.

contribution to modern farm practices in the Quebec community and far beyond.

Pierre Blais, Parliamentary Secretary to John Wise, Canada's Minister of Agriculture, conveyed the Minister's congratulations to staff and students of Macdonald College. "This complex is not an end unto itself," he reminded his audience. "Rather, it is a vehicle to help improve the efficiency of livestock production locally, nationally, and even in foreign countries.

"The role of Macdonald College in agricultural development, both nationally and internationally, is best described as active, visible, effective, and essential.

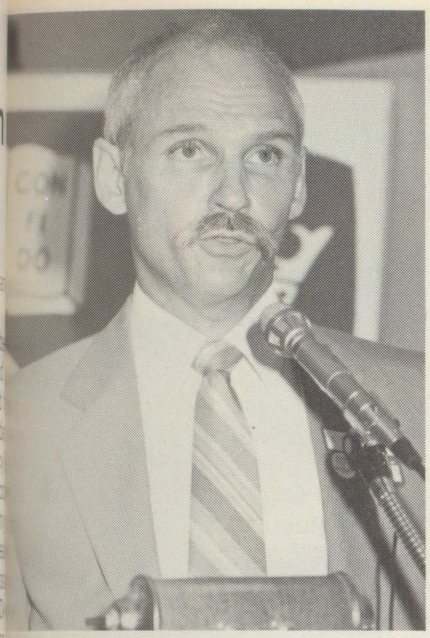
"The federal government has demonstrated its faith in this college in many ways. For example, Agriculture Canada has been providing research funding for a number of production-oriented projects here dealing with crops, animals, and soils. At the same time, Canada's Natural Science and Engineering Research Council (NSERC) is funding basic research in biology at this college and this is particularly important for the departments of Microbiology, Entomology, Animal Science and Plant Science. Additional research funding is provided by the Medical Research Council and from Environment Canada.

"Canadian interests have been well served by the facilities and talents found on campus here. And through the intermediary of the Canadian International Development Agency (CIDA) we have been able to use Macdonald's know-how to fulfill our country's mission abroad. Since we are speaking of animal science today, an outstanding example is work funded by CIDA in the West Indies, where staff from Macdonald College have worked with local producers to develop ways of using sugarcane by-products as animal feeds. Other CIDA support has gone to drainage and irrigation projects in Egypt, India, and Pakistan.

"It's because Macdonald College has done such a consistently excellent job on projects such as those that among Canada's agricultural universities, this has become the agency's number one choice for the implementation of foreign agricultural development projects.

"In laying this cornerstone today, I feel we are also laying a cornerstone in the development of Quebec's agrifood industry. I hardly need to tell you about the tremendous growth that this industry has experienced over the past decade — growths of roughly 40 per cent. Agriculture Canada is proud to have cooperated in that development, and our commitment remains strong. To cite some recent examples of our faith in this province's agricultural future, there is the new laboratory and swine research facilities being built at Lennoxville, the new office laboratory facility at St-Jean sur Richelieu, the food research centre at St-Hyacinthe, and the animal pathology laboratory that will be built beside it. I'm sure that the close cooperation that has existed between Macdonald College and Agriculture Canada over the years will continue as those new facilities come on stream."

Mr. Blais emphasized the government's commitment, in the present period of reduced federal spending, to



Dr. Jean Hébert, Research Director of Quebec's Ministry of Agriculture.

Howard Webster, l, is joined by Clifford Lincoln, MNA for the local riding.

Dr. E. Donefer of the Department of Animal Science, l, with Pierre H. Cadieux, MP for Vaudreuil, and Ken Charles from the Sugarcane Feeds Centre in Trinidad.

Principal Johnston, l, is joined after unveiling ceremonies by Mrs. David Stewart, representing the Board of Governors of McGill, Howard Webster, and Rudi Dallenbach, Farm Director.

building up Canada's capacity for research and development, describing R&D as a major national priority over the long term.

"The staff, students, and graduates of Macdonald College have performed extremely well over the years. They have earned and will continue to earn the support of the communities they serve. The new animal research complex can only enhance that fine reputation."

Research Called Key to Future Progress

Jean Hebert, Research Director of Quebec's Ministère de l'agriculture, des Pêcheries et Alimentation, represented Agriculture Minister Jean Garon at the cornerstone ceremony. He, too, addressed the role of research and development in building the vitality of society as a whole and congratulated Macdonald for its initiative.

"Macdonald has made major contributions to agricultural development in Quebec," he said. "Most recently, the Farm Days held here are a good example of how teaching and research are employed to the benefit of our agricultural community. In the dairy sector, new research remains indispensable to the health of a major farm industry. In Quebec some 45 per cent of farm revenue comes from dairy production. To maintain it, we need the kind of effective research capacity typified by this new Animal Research Complex."

Citing John Moxley's work in Dairy Herd Analysis, Alan Watson's research in control of weed pests, and other research in grain development, Mr. Hebert noted that in 1985 Macdonald had received about $1 million in research subsidies and contracts for laboratory testing from the Quebec government. Some $305,000 of that amount was for research in animal production.

"The economic potential of any society has traditionally been associated with its land area, its raw materials and its significant energy reserves. However, contemporary events show that the true wealth of a society springs from its creativity, its will power and its capacity to be adaptive. Research develops these aptitudes, and innovation — the product of research — reveals their presence.

Back on campus for the occasion, Dr. L.E. Lloyd chats with Henry Garino.

"The Ministry is more and more inclined to associate its activities with the excellence found here at Macdonald — an excellence which is flourishing — and looks forward to more opportunities for cooperation in the future."

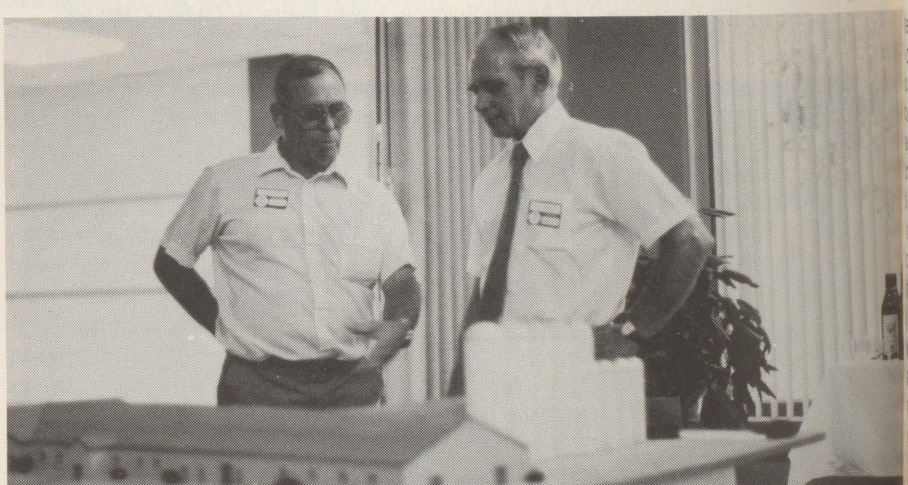
Major Gift Launched Farm Redevelopment

The new animal complex and farm redevelopment has been made possible through McGill's capital campaign, the McGill Advancement Program, with contributions from graduates, faculty, staff, corporations, and other friends, and through government funds.

Major impetus for the project comes from a significant leadership gift from R. Howard Webster, O.C., B.A., a distinguished McGill graduate and business leader. Mr. Webster is a long-time benefactor of the university. Dr. Buckland praised his initiative, as well as the impetus given the farm redevelopment by his predecessor, Lewis Lloyd; Rudi Dallenbach, Farm Director, and other staff whose planning shaped a development "unique in agriculture."

"This is a magnificant gift," McGill Principal David Johnston said as Howard Webster unveiled the cornerstone for the new Complex. "It is a building block of the new Macdonald." Remarks delivered by federal and provincial representatives, he said, "show our world as a global village. There are no easy solutions to international inequalities in food supply. But Macdonald College will stand ready — with modern facilities and advanced research capacities — to face the challenge of food production, storage, and distribution in a world growing ever more complex."

Examining the model of the new complex are, l to r, Sylvain Bédard, BSc (Agr Eng) '84, who made the model, Odette Ménard, an MSc Agricultural Engineering student, and E. McKyes, Chairman of Agricultural Engineering.



The model attracted considerable attention. Two experts in the field discuss the merits of the new building: Gerald Duncan of the Quebec Farmers' Association and Gordon Beaulieu, College Herdsman.

An Agricultural Offensive

The Need for Linkage Between Agribusiness and the University

by Dr. L. E. Phillip
Department of Animal Science

Agricultural production in Canada accounts for about one third of the nation's positive trade balance. In addition, the combined activity of production agriculture, plus food and feed processing and distribution (collectively called agribusiness) make a contribution of over 10 per cent to the gross domestic product (GDP), thereby making an important contribution to the Canadian economy. Agribusiness is also linked to other industries, such as farm machinery and equipment, fertilizer, chemicals, and pharmaceuticals. Were it not for agribusiness, demand for inputs from these industries would be substantially affected. The viability of agribusiness, however, depends upon inputs (trained students) and services (scientific expertise and information transfer) from universities. Given the current economic climate and government policy, it is evident that agricultural institutions may well become more dependent on agribusiness support for their long-term survival.

Agri-Food Network

The foregoing scenario is an indication of interdependence within the agricultural system, comprising agribusiness and related industries and agri-educators and researchers, to which I refer collectively as the agri-food network. An economic threat to any one component creates a ripple effect within the network with profound ramifications for the Canadian economy. Within recent years the agri-food network has been, in fact, threatened because of a drop in consumer demand for animal products, particularly red meat. This has triggered a reduction in farm income with severe implications for agribusiness. The purpose of this article is to draw attention to the need for improved "network interaction" to ensure the prominence and viability of Canadian agriculture.

Need for Consumer Education and Scientific Leadership

The decline in consumer demand for animal products essentially parallels the surge in knowledge about the interrelationships of food, nutrition, and health. Credit must be given to the health professionals who are informing themselves about linkages between food and health and are transmitting their understanding of food and nutrition to the public. Unfortunately, however, the gain in scientific knowledge regarding nutrition and health does not match the rise in popularity of books and media articles on the issue. Popular coverage of this topic has resulted in "health food" stores providing (presumably on demand) "nutritional supplements" such as DNA tablets and lecithin (a lipid-like compound) capsules designed to "improve" nutrition and health. Lack of consumer education and misunderstanding of what the body needs have given rise to food phobias among consumers; they are then driven to the purchase of "nutritional supplements" of dubious value.

There is obviously a gap in communications about real issues in food and health. As a result the media and the consumer have taken charge. In virtually no other field of science but food and nutrition does the consumer assume such authority of information. Bridge design and highway construction are left to the engineer; preference about drugs is left to the physician, and advice about computers is sought from the computer specialist. In the case of food and nutrition, the news media becomes the voice of authority with the result that information about food and health is grossly distorted. The consumer is at the forefront on issues of nutrition because he has taken food availability for granted. Virtually nowhere but in North America is he paying so little for food. Cheap food has resulted in a consumer who is no more knowledgeable about the quality of food than he is about the cost to produce food.

The consumer's interest in food, nutrition, and health is legitimate and welcome and should provide an opportunity to consumer educators to show leadership; perhaps a trip to the health food store is a cry for authoritative leadership in nutrition. It is now time for educational institutions to distill the facts and educate the consumer. The consumer, in the meantime, has spoken and has taken issue with the food producing sector, which now has to adjust.

Agribusiness in the Wave of Change

During the past 10-12 years the cost of farm inputs has increased dramatically. Despite a rise in prices received for agricultural products, price increases have not kept pace with rising costs. As a consequence, many farmers have found themselves in financial difficulty. Consumers, meanwhile, have enjoyed a smaller increase in the price of agricultural products relative to other consumer goods (Table 1). Faced with difficulty, farmers have attempted to reduce costs by manipulating inputs such as feeds, chemicals, and fertilizers. For example, farmers have dramatically increased on-farm production of feed grains (Table 2), and have cut back on the purchase of commercial feed for livestock.

These changes in farmers' cost-cutting strategies have had repercussions in industry. On-farm self-sufficiency in feed grains has given rise to what is referred to as "on-farm mixing" (i.e., feed preparation on farm) and a surge in small companies (premix companies) dedicated to the sale of nutritional supplements and feed additives to meet changing farmers' needs. Large feed companies, on the other hand, have seen their volume eroded in a market which is not growing and intense competition has given way to profound structural changes. Decentralization and capacity ration-

alization (i.e., adjusting manufacturing capacity to meet product demand) have characterized industry response to changing farmers' needs.

Change vs Progress

Agribusiness must certainly continue to adapt to changing market conditions but equally important is that the adaptation to change truly leads to efficiency and competitiveness in agricultural production. Unless the true constraints to efficiency of production are addressed, adaptation to change does not necessarily ensure progress. There are areas where there has been virtually no change of practice within the farming community: these are constraints to agriculture efficiency.

Take the case of reproductive management in dairy cattle. In recent years we have witnessed an increased incidence of reproductive problems on dairy farms in eastern Canada. It is difficult to determine to what extent these problems are due to genetic selection for milk production or to feeding and other management practices. We know, however, that improvement in practices of heat detection leads to substantial gains in reproduction efficiency, an important determinant of profitability on the farm. In spite of such information, changes in attitudes towards reproductive management have been slow. Consequently, progress in efficiency of cattle production is being limited by slow progress in reproductive management. Bold efforts are needed to change farmers' attitudes towards reproductive management. Improvements in heat detection practices would have a positive impact on farm profitability and thus on agribusiness. The entry of herd health veterinarians into farm management practice is a positive sign; however, herd health and reproductive programs on farms are a minority practice. A re-focusing of agribusiness on the reproductive process in livestock production could be an appropriate adaptive response to ensure its survival.

On-farm record keeping and data management are also areas where improvements are needed. Surveys show that less than 10 per cent of farm operators use computers in their business; this is a testimony to the need for improved efficiency of data management in agriculture. A "gathering of the facts" is perhaps the greatest challenge facing agricultural producers and agribusiness as a whole. Sound decisions can only be made when all the facts are known. Lack of reliable information within the farming community necessarily leads to errors in judgement among marketing strategists in agribusiness. Given that enterprise profitability is a marketing function, I would argue that changes in attitudes towards information management as well as improvements in market planning would lead to progress in agribusiness.

Finally, there is an urgent need for improved techniques of financial management within the farming community. Lack of budget planning and business management techniques represent real constraints to economic success on the farm. Table 3 reveals that financial charges account for up to 15 per cent of farm expenses in Canada. The use of financial consultants as part of the farm management team in agricultural production could have a positive impact on farm viability.

During these times of change what is needed in agribusiness is a "change of approach" towards efficiency in agricultural production. By concentrating on new ideas in information management, market research, and financial planning in agriculture, agribusiness leaders can ensure the viability of the industry. It is through such professionalization of agriculture that agribusiness could be assured of economic success and international competitiveness. Now is the time for more professional agriculturists to enter the field and for the current farm operator to improve his level of education and training. Through such train-

Table 1. Selected indicators of economic change in Canadian agriculture between 1961 and 1983[1]

	1961	1971	1983	% change 1971-1983
A. **Farm Costs** (Canada)	------- indexed costs --------			
Total farm costs	73.5	100	296.1	196
— fertilizer	101.8	100	301.9	201
— machinery	76	100	302.8	203
— interest on debt	86.4	100	297.7*	198
B. **Farm prices** (Canada)	-------- indexed price -------			
Agricultural products	77.3	100	271	171
Dressed hogs	105.8	100	273.6	174
Slaughter steers (A_1, A_2)	66.3	100	229.8	130
C. Consumer Price Index	75.1	100	290.9	191

[1]Source Statistics Canada
*Value for 1981

Table 2. Changes in on-farm production of grains*

	1978	1981	Change, 1978-1981
	---- '000 tons ----		
Eastern Canada	6,552	9,032	+38%
Quebec	1,052	1,740	+65%
Ontario	5,238	6,999	+34%
Atlantic	262	293	+12%

*Livestock Feed Board 1982 Annual Report

Table 3. Contribution of the livestock sector to Canadian and Quebec agriculture in 1984[1]

	Canada	Quebec
	A. INCOME	
Total farm cash receipts, $ million (M)	19,971	2,993
Cash receipts from livestock, $ M	9,680	2,268
Proportion of total receipts Derived from livestock, %	48	76
	B. EXPENSES	
Total operating expenses, $ M	13,726	2,110
— Feed, $ M	2,162	705
— Machinery, $ M	2,490	250
— Fertilizer, $ M	1,339	158
— Interest charges, $ M	2,090	258
Feed expenses as a proportion of total expenses, %	16	33

[1]Source Agriculture Canada 1984

ing the farm operator can acquire skills in farm (business) management and become familiar with new technologies and techniques of production, thereby improving his chance of economic success.

Agribusiness is about to witness another wave of change that would impact strongly upon production techniques and industry viability. I refer to the emerging science and technology called *Biotechnology* that involves genetic engineering for new crop varieties, commercial production of hormones (e.g., growth hormone), bovine interferon and vaccines through gene cloning of bacteria, and improvement in fibre digestion in ruminants by genetic manipulation of rumen microflora. Current research indicates, for example, that administration of bovine growth hormone in dairy cattle increases milk production 20-40 per cent. The commercial availability of such a product would mean a substantial reduction in the number of cows needed to produce milk; this would have a substantial impact on the dairy (and meat) industry. Research is also underway to genetically modify rumen bacteria to improve the digestion of very low quality roughage and also to allow the use of an array of by-poducts; studies also indicate that it is possible, through biotechnology, to change the amino acid composition of rumen bacteria so that the quality of protein available to the host can be improved. These new developments in fibre and protein nutrition of the ruminant will have a profound effect on the feed industry, since the need for commercial protein and energy supplements could be reduced. These are new technologies which agribusiness will have to face within a few years; more adaptation will be required.

Effective adaptation to this new technology will require much more sophistication in agricultural business management if the industry is to be viable. Some sophistication in agribusiness requires the co-ordinated efforts of agribusiness and agricultural teachers and researchers.

Agricultural Research and Training

Progress in agribusiness requires research input from the university. Too often, however, a motive for interaction between industry and the university may be lacking. Funding for research by industry often imposes limitations on academic freedom to publish and, consequently, the scientific enthusiasm to advance knowledge may be dampened. I believe that the competitive edge in agribusiness is pivoted on the company's ability to *translate* knowledge into economic success, rather than on its ability to *acquire* knowledge. Therefore, agricultural research should not be hamstrung by narrow and short-term interests of industry. There may be need for a reappraisal of the rules of funding by industry.

Of course, some research may lack focus and some may suffer from the "bandwagon syndrome" where there are not enough originators and too many followers; this could be a problem since not enough money may be spent on innovative ideas. Projects requiring interdisciplinary activity would widen the scope of agricultural research in Canada and could provide a point of focus that could stimulate interaction between agribusiness and the university. The emerging field of biotechnology offers a real challenge and opportunity for such interaction.

Improvements in interaction between the university and agribusiness would lead to establishment of common objectives and strategies, which could be put to use for agricultural training in such vital areas as information and research management, marketing, new technologies of food production, and consumer education. The establishment of common ground could be the start of an effective "agricultural offensive" that would ensure the long-term viability of Canadian agribusiness.

Acknowledgements

The author wishes to acknowledge the useful discussions with Mr. P. McLean of Ralston Purina and Dr. H. G. Coffin of the Department of Economics; the valuable comments on the manuscript by Mr. H. Garino of Animal Science and Dr. C. Madramooto of Agricultural Engineering are appreciated.

A group of recent graduates in Agricultural Engineering from Tunisia with a tour guide from WUSC (World University Service Canada) visited Macdonald in July to obtain further information in their field.

Water Resources Engineers from Indonesia visited the campus with people from CIDA and Lavelin Consultants in September to obtain information on irrigation and drainage research and training programs.

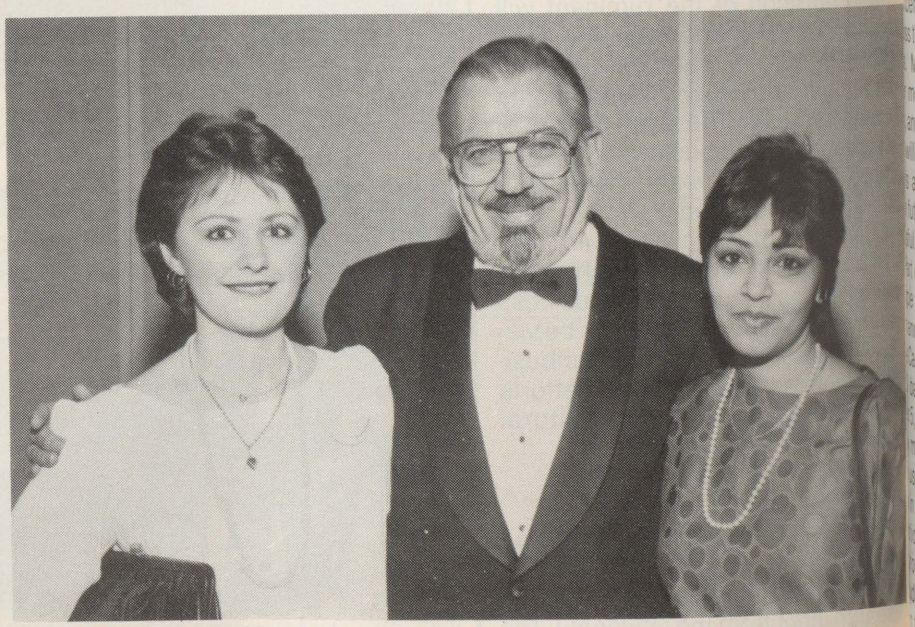
Seeking Solutions

Efficiency, productivity, adoption of new technology, and supply management — these factors are, and continue to be, of concern to the dairy industry in Quebec and eastern Canada. **PROFESSOR GARTH COFFIN** of the Department of Agricultural Economics feels there is widespread concern that supply management and formula pricing will weaken the farmer's incentives to improve productivity through new technologies. However, Professor Coffin also recognizes that supply management and improved income may increase investment in new technologies. Thus, the question of whether supply management accelerates or retards the adoption of new technology remains open. Professor Coffin has received research funds from Agriculture Canada to look into this problem. Changes in productivity, size, and other characteristics of the industry in Quebec and Ontario will be studied and ways to determine technology use and technology input will be assessed. When technology can be measured, then it will be possible to analyze the effect of supply management on the rate of technology in dairy production. We should find out what the level of technology is, how technology varies from farm to farm, and at what rate improvements in technology are being acquired by dairy farmers in the province. Results of this work will provide essential information for policy makers as well as producers.

Can packaged fresh meat be stored on the shelf without refrigeration or other expensive storage facilities? **PROFESSOR JAMES SMITH** of the new Department of Food Science and Agricultural Chemistry at Macdonald College feels such storage may be feasible. Professor Smith will look at modified atmosphere packaging as well as some of the newer techniques to reduce oxygen levels in packages. In fact, a whole host of procedures will be looked at, ranging from initial washing of meat carcasses with sanitizers, to modified atmosphere packaging, to use of additive pellets. Contradictory information exists on the optimum gas mixtures for modified atmosphere packaging. Professor Smith feels this is because the variables have been studied in isolation. To avoid this limitation, he will use a process optimization technique to provide more information in less time and thus enable optimizing of storage. Funding from Agriculture Canada should speed this study along with the help of graduate students in the Department of Food Science and Agricultural Chemistry.

Optimization is also being studied, but of a different sort, by **PROFESSOR ROBERT KOK** of the Department of Agricultural Engineering. He hopes to develop a sophisticated and intelligent greenhouse operating system for the horticultural producers in Quebec. Humidity and temperature sensors, control systems and a computer communication system will be used. A computer and a servo system are being developed for greenhouse use. And that's the easy part. The difficult part may be the development of software to combine all of these variables in an intelligent way in order to optimize greenhouse operation without the intervention of human error. Professor Kok and his group even envisage an alarm system which would warm greenhouse operators of unauthorized entry. Needless to say, this is a long-term project but the net result, if it results in significant energy and labour savings, will be of major benefit to a very important sector of Quebec horticulture production.

Other work in the Department of Agricultural Engineering includes studies by **PROFESSOR ROBERT BROUGHTON** on the use of brackish water for subsurface irrigation in Quebec. Professor Broughton reasons that if subsurface drains can be used to remove water from soils in Quebec in the spring, they should be able to be used to supply water during summer drought periods. Professor Broughton has shown that increases of two to four tonnes per hectare of grain corn can be obtained by subsurface irrigation in sandy soils in dry years. Thus, 30,000 hectares of sandy soils in Quebec could be exploited for this kind of irrigation technique at low cost. But this is only half the project. Professor Broughton also plans to study the use of brackish well water, which is quite common in Quebec, for irrigation purposes. Studies in California and Israel have shown that saline water, if properly used, can result in little or no loss in yield compared to irrigation with fresh water. If both subsurface irrigation and brackish water techniques prove feasible, it should open up a significant area of irrigation for Quebec farmers.



Louise Jacques, l, and Smita Shah, attractive bookends for Associate Dean Jean David. The students, both majoring in Food Science, received Food and Nutrition Research Foundation awards.

Ag Canada Employees

"Hit the Books" at Macdonald

by Hazel M. Clarke

Team effort here at Macdonald, willing and enthusiastic students — even the wave at the Montreal Forum — all combined to make a two-week Basic Pesticide Training Course for 30 staff members of Agriculture Canada from across the country an unqualified success. Macdonald College hopes to offer more such courses, short and long, and the lessons learned from this one will prove valuable and, if the students are of the same high calibre, then future courses should be as successful.

Part of the job requirements for the people working with the Food Production and Inspection Branch of Agriculture Canada involves working with over 600 basic chemicals formulated in over 5,000 brand name products, and they must be trained in all aspects of the usage of these chemicals. With this in mind, Jim Reid, Director of the Pesticide Division in Ottawa, approached several institutions, including Macdonald College, asking them to submit a proposal for a pesticide training course. The one from Macdonald was accepted and on Monday, March 18, classes began at the Holiday Inn in nearby Pointe Claire.

"Modern technology changes so quickly that by the time people have finished university much of what they have learned is already out of date. There is a great need for constant updating, and it was exciting to be asked on behalf of the college to co-ordinate this program," said Marcel Couture, Director of Extension Services, "but," he continued, "the deadline to set it up was very tight. However, after lots of discussion with the various department chairmen and the instructors, we felt we could offer the course. Many of the students were graduates from a science program but not necessarily an agricultural one so the actual studying about pesticides was new for some of them."

There were two students from each province plus a number from Ottawa, including the pest division, the compliance department, the laboratories, and technical services.

Armed with a tentative outline supplied by Agriculture Canada, Marcel Couture and the three main instructors, Professors Alan Watson and Rick Reeleder of the Department of Plant Science and Bill Yule of the Department of Entomology set up a program. To complement this team, Professor Robin Stewart of the Department of Entomology, Professor Bill Marshall of the then Department of Agricultural Chemistry and Physics, and C.G. Halliday of Chipman Chemicals and K.A. MacMillan of Monsanto also instructed the class.

The early part of the course dealt with basic chemistry, formula, and application of pesticides and a lot of emphasis was placed on pesticide safety, labelling, disposal, legal requirements, and environmental responsibility. The sessions ended with an indepth look at selectivity, resistance, and the emergence of new and potential pest problems. It was a very full two weeks!

"The students worked hard and put in some long hours, including homework and extra reading, but they seemed pleased," Marcel Couture said.

Professor Rick Reeleder of Plant Science agreed that the students worked hard. "The students appeared to have hidden reserves of energy which they could draw upon at will. In

fact, by the end of the course they seemed to be in better condition than the instructors, who had to deal not only with the presentation of the lecture material, but also with a very short lead time to prepare the material. We hope this will not be a problem for future courses and we might want to consider the establishment of a system of modules, each dealing with a specific subject, which could then be mixed and matched with the requirements of each client group in mind. In summary, however, I would say that participation in this course was certainly useful for me, both as an instructor and as a researcher.

In a letter from Robert Puddester received after his return to St. John's, Newfoundland, he said, "I found the course very informative, and it gave me a sound exposure to the theoretical aspects of pesticide use. The reference material has proven very valuable in my job — to be able to retrieve the required background information when a pesticide issue arises. The course was well organized and the social events provided a good forum for the exchange of information between faculty members and my colleagues."

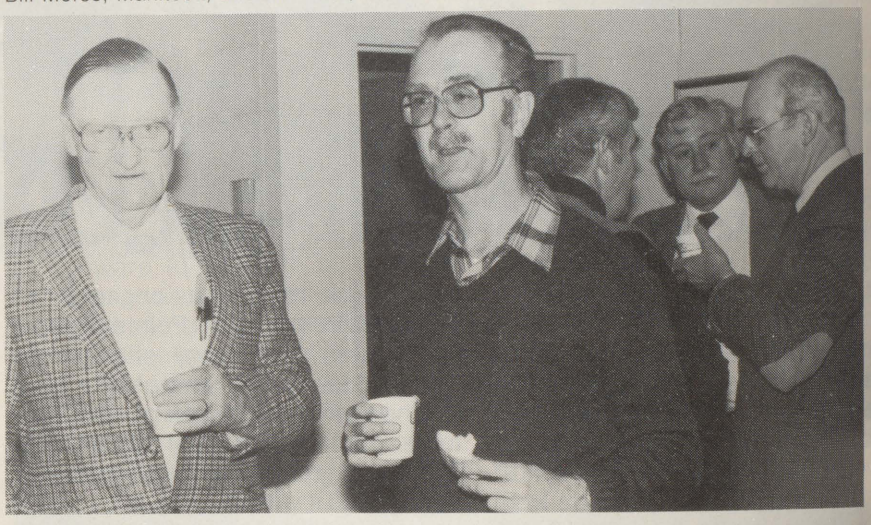
Professor Watson met André Caron from Agriculture Canada's Montreal office at a meeting in Rimouski and he again said how much he had enjoyed the course and being at Macdonald.

Marcel Couture said that the course evaluations, which were done at the conclusion of the course, were mostly positive as were most of the comments I heard when I joined them for a social occasion. Hugh Burgess from the London office said that he found the course was a good one, even though the first couple of days were a little slow. He wasn't sure as to whether it was the course content or that he was just not used to sitting down and listening.

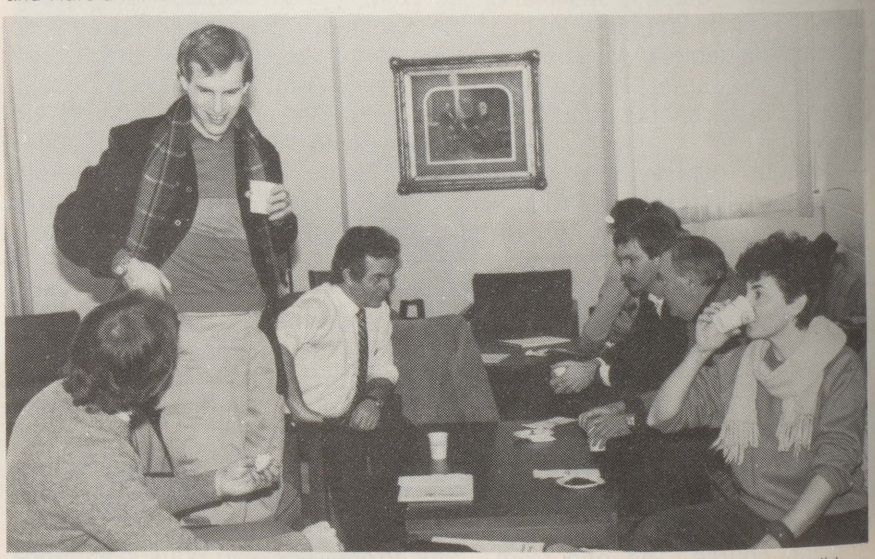
Marcel Couture pulled a couple of evaluation sheets at random: "The use of various instructors was excellent." "The use of outside instructors was excellent." "The information provided was good and presented in a good format." "The handouts are easy to use reference material."

Adeline Peake, who is in the Laboratory Services Division in Calgary, wrote: "Due to my analytical background, the course was a refresher course of past technical training. R.D.

Agriculture Canada employees were from Ottawa and every province in Canada. Enjoying a reception at Macdonald, l to r, Marcel Couture, Director of Extension, Dr. Jean David, Associate Dean Public Relations, Yuk Wigfield, Ottawa, André Caron, Quebec, Bill Morse, Manitoba, and Jim Reid, Director of the Pesticide Division, Ottawa.

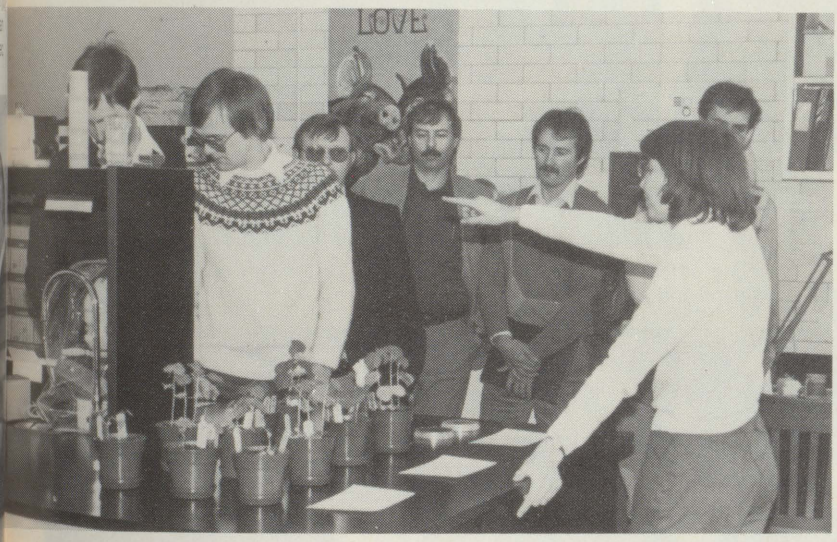


G. Hart, Alberta, and Jim Taylor, British Columbia, were interested in learning more about Macdonald. In the background are Professors Robin Stewart, Norman Lawson, and Harold Klinck.



A group of "students" and Mac staff exchange views, possibly on pesticides, possibly on the up-coming hockey game.

Vendell Bomberry, l, Ontario, and Ed Heinricks, Alberta, take the opportunity for a rivate lesson from instructor Professor Alan Watson.



tour of the college's research facilities included a visit to Professor Alan Watson's ab with Anne Collette acting as guide.

udi Dallenbach, Farm Director, l, gave the group a tour of the college farm.

Reeleder's lectures on fungicides were an area with which I was not familiar and which proved to be extremely interesting. In all the lectures the training which was of special interest was the biological pathways and modes of action by the various pesticide classes.

"C.G. Halliday of Chipman Chemicals provided a real and accurate account of the problems that can arise in mixing incompatible formulations. It became very evident how important the message is regarding the use of pesticides: 'Follow the label instructions carefully.' How marvelous it would be if lectures such as his could be provided consistently to farmers. An important aspect of this training, which must be emphasized, is the fellowship which was developed among participants and the professors. Firstly the participants all received an opportunity to discuss common aspects regarding their work and in this regard a form of self participant training occurred. Secondly, the professors all provided such an enthusiastic command of the knowledge and expertise in pesticide training that it was clearly evident how much knowledge transferred to the participants through a genuine interest by the students."

"The instructors certainly put a tremendous amount of energy and enthusiasm into the course," Marcel Couture said, "and they really enjoyed teaching this particular group. The class spirit was excellent and all of the instructors have asked if we are going to offer the course again."

Professor Bill Yule is just a little more cautious in his reflections on the two-week course: "Being realistic," he said, "I think we were all rather fortunate that things worked out as well as they did. The Agriculture Canada planners did not seem sure of the objectives of the course, the students were of quite mixed backgrounds and experience, and the instructors were not aided by the short notice that was given for preparation of this course in the middle of our regular term. (The professor's nightmare is going before a class poorly prepared.) However, we all mucked in, the students worked hard and forgave us when we used hand-written overheads and handouts, and some of them even laughed at our jokes — used to cover a moment of confusion, poor notes, or fatigue. They were a good crowd, mixed well with

each other and with Mac people, seemed interested in learning and appeared to have a good time, too."

Professor Alan Watson pointed out that Marcel Couture worked extremely hard to co-ordinate the whole event. As well as attending lectures, the students also got the opportunity for some social life and visits to Macdonald. Those that wished to could use Macdonald's athletic facilities and volleyball games were organized. A day was spent meeting some of the academic staff at Macdonald, visiting some of the labs and other research facilities on campus, and a tour of the college farm and Lods Centre took the group closer to the Morgan Arboretum where a typical sugaring off party soon got underway.

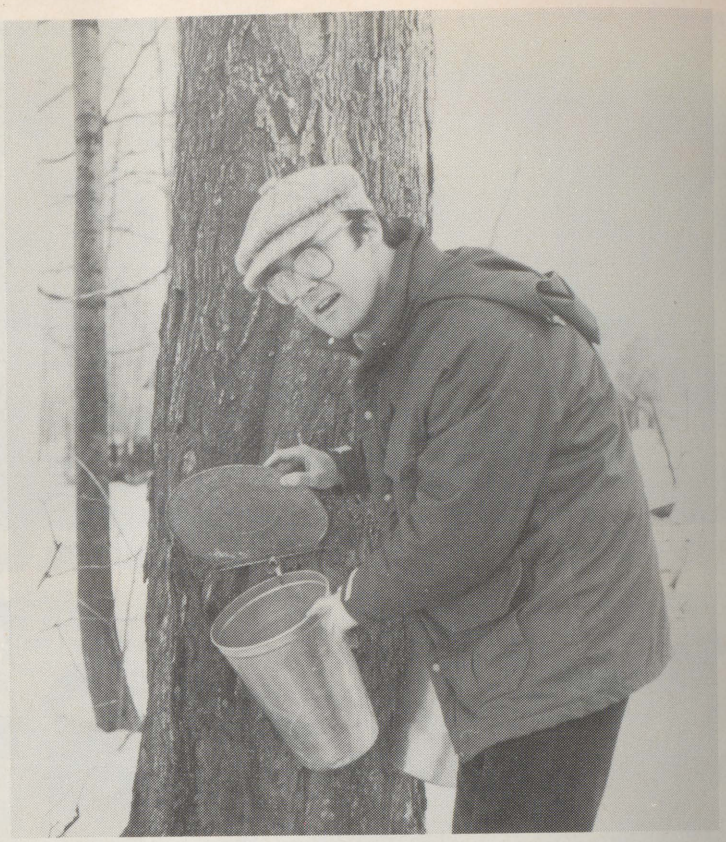
As Russell Knapp from the Willowdale office said, "This particular day must have been provided by your Chamber of Commerce because the wind is still and the sun is bright."

For many it was their first experience in a sugar bush, and it was much appreciated.

"The sugaring off party was the best of all," exclaimed Ron Melnyr from Halifax, Nova Scotia. "I'd suggest you keep that in future programs."

It would certainly be kept in any course offered in the early spring but at that time of year as the students are still on campus we are unable to use the residence and classroom facilities. Certainly similar arrangements can be made but alternatives have also been suggested. One would be to use McGill University's Gault Estate. "We could have a group of people almost on sabbatical — all by themselves for a couple of weeks," Marcel Couture pointed out. "If it was offered in the late spring or during the summer, then I think our instructors would welcome being away from campus for a few days. The Gault Estate is an excellent environment for learning. Or perhaps we could have one- or two-week courses right here on campus, providing that they are not held during the school year. Of course, a one- or two-day course could be done at any time; including evenings and weekends."

Towards the end of the Basic Pesticide Training Course the Agriculture Canada students travelled to Montreal to have dinner in Yvan Cournoyer's Brasserie. Here they got an opportunity to meet CBC radio's agriculture commentator Marc Côté. Next it was



Sugaring off! For some a totally new experience. Robert Puddester of Newfoundland enjoys a taste of sap.

Pouring hot syrup over cold snow. Ila Cornish and Jim Reid from Ottawa and Mark Wilcox from Saskatchewan and their colleagues prepare to "dig in."

off to the Montreal Forum for a hockey game which, by the way, the Canadians won. One of the students told me that it was his first hockey game at the Forum since he was there to see Maurice Richard score five goals and beat the Toronto Maple Leafs 5-0. Another found the wave almost as exciting as the game. The social activi ties chosen seemed to have been a successful mix with the lectures given

"I would not like to overlook the hospitality as the efforts made on the part of the professors, Marcel Cou ture's secretary Clair Blais, Macdonald College staff and others are truly

Gary Rieger, Chatham, Ontario, and Marie-José St-Victor from Ottawa. The expressions say it all — mmm good! In a note Marie-José said, "the course was very informative, albeit intensive, for us on the Pesticide Call-Line." She sent regards to the instructors with this comment: "They have organically fertilized the arid soil of our desolate minds concerning agricultural use of pesticides."!!

Russel Knapp, BSc (Agr) '53, outside the Chalet Prûche in the Morgan Arboretum.

cherished by a westerner who, before this training, thought western hospitality to be unsurpassed," wrote Adeline Peake from Calgary.

"It was fun to have them come to Macdonald," Marcel Couture said, "It showed the excellent cooperation that has always existed between Agriculture Canada and Macdonald."

Marcel Couture is pushing very hard to see more professional development courses being organized by Macdonald College. "We see ourselves dealing with such professional groups as agrologists, engineers, veterinarians, technologists, and others, or employers such as co-operatives, Agriculture Canada, the Quebec Ministry of Agriculture. Then there are producer groups and breed associations: the Union des producteurs agricoles, the Quebec Farmers' Association, the Quebec Young Farmers.

We would like to offer these groups on demand the specific course that would meet their needs. They would make the request to us, and we would come up with an agreement. The faculty is very much behind this type of program, because we want to make sure that the results of our research go beyond our walls and this is one way to do it."

I know that Macdonald would be pleased to welcome the Agriculture Canada group that were here last March back on campus at any time. If all such future groups are as keen, we foresee a good future for these professional development courses.

Russell Knapp

One of the 30 Agriculture Canada employees attending the Basic Pesticide Training Course was a Macdonald graduate, Russell Knapp, BSc (Agr) '53. Russell is a regional specialist in the Food Production and Inspection Branch in Willowdale, Ontario. He was pleased to have the opportunity to be back on campus. He said that he had often passed by the college on the way through to Montreal but hadn't really been back on campus since the early 60s when he'd take a detour to have a look around the grounds before continuing on to visit relatives.

"I would like to get back for Reunions," Russell Knapp told me, "but I usually take a fall holiday and am

away at that time," He has been able to keep up with some Mac news as he often meets fellow graduates at meetings and on his travels.

"Coming out here has brought back a lot of pleasant memories," he said on the day the Agriculture Canada group met at the Chalet Prûche for the sugaring off party. "Earlier in the week I came out one night to watch the volleyball game for a while and then decided to walk around the campus. It was the first time that I fully realized that many of the buildings are no longer being used by Macdonald. I was very sorry to see Brittain Hall boarded up. I've seen a lot of changes, a lot of new buildings but the barns look just the same to me. I'm pleased to see that the new buildings are compatible with the old ones — things look good!"

Russell Knapp took Plant Pathology when he was here and remembers spending most of his time in the Biology Building. "It was a small campus with a small number of students and you knew everybody by sight and many by name. The temporary buildings — the huts — were still around when I came in '49. We were in another row from what was known as Diaper Dell where the veterans lived. When I started we had maybe the last of the returning veterans. The Diploma students had a row behind us, and I remember there was the odd bit of boyish fun between the rows.

Russell Knapp said that he still sees his classmates from time to time, usually unexpectedly. "You walk across the room and there is someone you know at a meeting. Most are involved in agriculture somewhere, some in industry and many have kept close ties with Mac." After graduation he got a job in the Sault at a research station. He then worked in Belleville and finally down in the Chatham area.

Russell Knapp was enjoying the course and the chance to exchange ideas with his colleagues. "I know virtually everyone," he said, "the basic group are my counterparts from the other provinces and the other big group are people from Ottawa headquarters and from our two laboratories."

Speaking about the pesticide course he said that at some of their national meetings he and his counterparts from other areas had identified a need for training, particularly for some of the younger employees on staff. "We are begining to specialize a little more in some areas and one area where there is going to be more manpower is in pesticides," he explained, adding that some of the people attending the course only work with pesticides. "I was part of the group trying to get the course to go, and I'm pleased that it has taken place because these first few days have really been very good — back to a bit of basics and then some practical information."

Speaking with Russell Knapp on the last morning before the students headed off home he still seemed pleased with the course and felt it would truly benefit both himself and his colleagues. He also seemed to have enjoyed his visit to Macdonald and the opportunity to do a little reminiscing.

Time for certificates and a token of appreciation from Macdonald: Marcel Couture, l, with Mark Wilcox, Saskatchewan. Watching is Ron Melnyk from Nova Scotia.

Instructors, l to r, Professors Bill Yule, Rick Reeleder, and Alan Watson with Don Mondor from Ottawa.

It's a Mac beer stein! Obviously pleased are Adeline Peake, Alberta, and Yuk Wigfield, Ottawa.

BIOTECHNOLOGY AND WEED CONTROL

A series of seminars were given on a wide variety of interests of Macdonald academic staff on Leadership Day which was held in conjunction with grad Reunion in September 1984. One of the seminars was by Dr. A.K. Watson, Associate Professor in the Department of Plant Science, and we are pleased to bring you an edited version of his talk on these pages. Since joining the Department in 1975, Professor Watson has shown a keen interest in integrated weed control programs involving insect populations and pathogens.

Dr. Gordon Maclachlan, Vice Principal of research and Macdonald Professor of Botany at McGill, introduced Alan Watson to graduates and guests at the seminar and we quote, in part, from his introduction.

"Alan Watson is a young man, still in his mid 30s. He received his doctoral degree from the University of Saskatchewan about nine years ago. He has been extraordinarily productive in a field that is not brand new but so close to being new that applications of it are just now beginning to appear. It is a field that is related to biotechnology — one kind of biotechnology — it is the employment of unusual organisms in order to control pests — weeds of a whole variety of descriptions.

"Alan Watson exemplifies also the east-west exchange that goes on between McGill University in particular and Macdonald College especially and the western universities.

"Alan came from British Columbia originally but he moved to Saskatchewan and then saw the light and came to the Macdonald campus. I was with the President of Canadian Pacific out in Saskatoon recently announcing a $1 million gift to three prairie universities and McGill for fostering exchanges in research in problems relating to western agriculture. Canadian Pacific felt that this was a major contribution that they could make to continue their long tradition of being at the frontiers of Canada so to speak. They want to employ the new techniques of biotechnology to solve these ancient and old problems that have been with us for many, many years.

"What Alan Watson is doing is exactly the direction that Canadian Pacific anticipated that we would want to be going anyway and, with their help, I can see that Alan is going to be spending a lot of his time in the West as he now does anyway because he has used a whole variety of disease organisms to control pests like Canada thistle. Today's talk is on his most recent research which is using a wierd and wonderful fungus that murders "literally" a terrible weed that infests about 10 million acres of corn and soybeans here and in the United States. This is a noxious weed that farmers have been having a terrible time with and it's getting worse and worse all the time. Seed growers and farmers are alarmed by it because they cannot use classical weed killers on it as the weed happens to be closely related to the soybean and what kills the weed kills the soybean, so the way to attack it is the way that Alan has most inventively come up with."

Weeds are a constant component of our agricultural environment and a major concern of our agricultural producers as they can cause great economic losses. While other pests such as insects and pathogens tend to be rather dynamic — they appear suddenly some years and in others are not a problem — weeds are a constant component of our agricultural communities.

There are a number of different methods that are being used for weed control: preventive, managerial, physical, chemical, biological, and integrated. I'll briefly mention these different methods of control to prevent weed infestations. It is important to have clean seed. Competitive crops can be used in a managerial approach as a farmer can chose a crop that is more competitive than a weed species. Crop rotation is also a very useful approach and can be utilized very effectively to remove many weed species. Plastic or paper mulches have been used to good advantage in certain crops such as strawberries. Tillage has been used over the years and is an effective control although there are strong indications that we use tillage too much, particularly for our moist soils, and that it can lead to extensive soil compaction. The major revolution in weed control has been the use of chemical herbicides. Though these still remain the primary method of controlling weeds in our agricultural communities, there is some interest in and a considerable amount of work on biological controls.

From hoeing to biological control — though each has its advantages and limitations — all methods are effective in a totally integrated weed management system, and it is important for the farmer to develop an integrated control strategy utilizing whatever methods he has available to maximize the effect on the weed population.

Biological Control

Biological control is the deliberate use of natural enemies to reduce the population of a target weed. We manipulate the natural enemy in some way or other to obtain a reduction of the undesirable weed population. Different types of organisms have been used in biological weed control programs including insects, plant pathogens, nematodes and, in the aquatic environment, fish. In most instances insects have been the biological control agents of choice because entomologists were the ones that pioneered biological control of weeds.

The methods used in biological weed control include the classical approach, the inundative approach, and the herbivore management approach. The classical biological weed control method is directed toward those weed species that have been introduced into North America in the absence of their natural enemies from their native range. Approximately 75 per cent of the most noxious weeds in North America have been introduced from either Europe or Asia. Many of our forefathers immigrating to the New World came with their bags of crop seed, but they also inadver-

tently brought the weeds. These weeds became established without their natural enemies and, as a result, they have become, in most instances, much more aggressive and far more of a problem than they were in their native range. Classical biological control involves going back to the country of origin of the weed and searching for and finding those organisms that are host specific and damaging to the weeds. These natural enemies of the weeds are then introduced and established in our country. The classical approach has generally been limited to single weed species that dominate large areas such as grasslands and pastures where there is a minimal amount of disturbance and is definitely not suited for cultivated situations such as the corn field or the soybean field. In cultivated fields weed populations tend to be composed of a complex of weeds rather than a single dominant weed species.

The second approach to biological control is inundative. This approach involves the manipulation of the weeds' natural enemies by man. The biological control agent may be native or an introduced organism. Inundative biological control includes the mass rearing of insects and their release and the use of biological herbicides. Biological herbicides utilize large quantities of a fungal pathogen to control a weed species and are applied in the same manner as chemical herbicides.

Herbivore management, the third approach, is managing a herbivore population and concentrating the grazing effect on the population of weeds. This has been done, and quite effectively, in some situations. Sheep preferentially graze certain weed species and through a management program using sheep the biological control of some weeds has been obtained. Similarly, and perhaps the best example, is the use of a fish — the grass carp — for the control of aquatic weeds. With plant pathogens there are two approaches available: the classical tactic and the bioherbicide tactic. As mentioned previously the classical approach is for those weeds that have been introduced into the country while the bioherbicide tactic is generally directed toward native weed species using those organisms that are already occurring here on the weed population. As an example, Canada thistle *(Cirsium arvense)* is a major problem

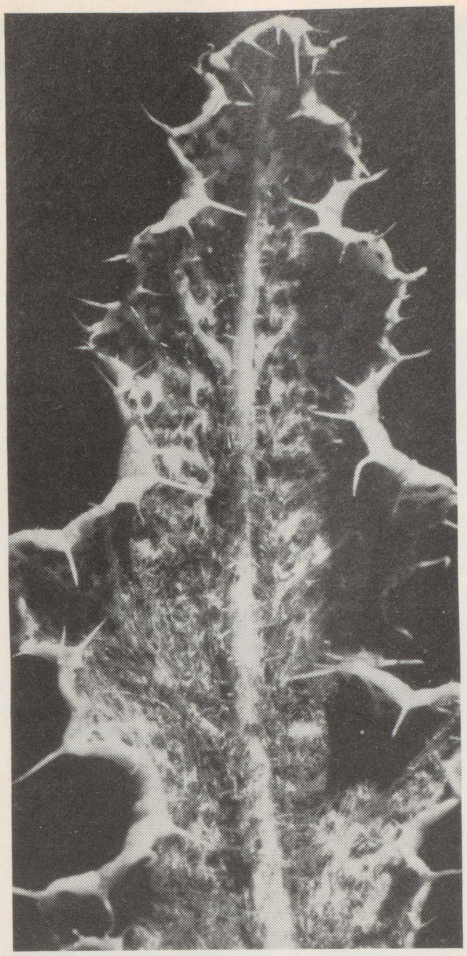


Photo 1. Rust on Canada thistle.

weed throughout Canada but primarily a problem in western Canada. Throughout North America Canada thistle is occasionally attacked by a rust fungus. The rust seen in Photo 1 illustrates the potential effectiveness or the degree of damage that can occur with a rust fungus or a pathogen on a weed and makes a strong point for biological control of weeds.

We have a unique quarantine (containment) facility here at Macdonald College as it is the only one of its type in Canada. There are two similar facilities in the United States, and I am collaborating with scientists from one of them in the classical approach whereby we are investigating host specific plant pathogens from overseas. Experiments are being conducted to determine whether or not it would be feasible to introduce these pathogens into North America for control of widespread rangeland type of weed species. With the quarantine facility we are studying rust fungi *(Puccinia species)* which have been collected in Europe. We have a very virulent rust on nodding thistle *(Carduus nutans),* a noxious pasture weed, and in collaboration with U.S.D.A. scientists we have demonstrated that it is relatively host specific. We are waiting for subsequent permission to have it released in North America.

Another major weed problem is a complex of species — the knapweed species in the western part of Canada and the United States. We have done rather extensive host range studies with at least three different species, and have another one in culture that we are now evaluating. We have demonstrated the potential effectiveness of these rusts on the weed populations but further studies are being conducted prior to requesting permission for release of these pathogens in Canada.

Mycoherbicides or Biological Herbicides

The term mycoherbicides has arisen because most of the organisms that are being evaluated as possible bioherbicides are fungi; theoretically, we could be using bacteria and possibly other microorganisms, but by far the major effort has been with fungal pathogens. The first work was done in the early 70s on the weed northern jointvetch *(Aeschynomene* virginiaca) with a fungal species, *Colletotrichum gloeosporioides* f.sp. *aeschynomene.* Northern jointvetch is a major weed in rice in the southern United States and is a difficult weed to control. If you have ever purchased rice and noticed little black seeds in it, it has probably been northern jointvetch. The fungus was observed in research plots in Arkansas where scientists were conducting herbicide trials for the control of northern jointvetch. However, before the herbicides could be applied the young weeds became infected with a disease and were dying. The fungus was isolated from the diseased tissue and has subsequently been developed as a biological herbicide which is capable of providing 99 per cent control. In 1982 it was registered as a mycoherbicide in the United States; its tradename is COLLEGO.

There is one other material that has been registered in the United States as a biological herbicide and it is called *DEVINE.* It controls a very serious vine weed in citrus orchards in Florida. Both *DEVINE* and COLLEGO have very restrictive markets as there are limited

Photo 2. Dr. Alan Gotlieb of the University of Vermont in a corn field infested with velvetleaf.

acres of rice in the southern United States and limited acres of citrus vine in Florida.

The principles of using these plant pathogens for the biological control of weeds are based on the plant pathologist's epidemiological triangle where there are three major components within the system — the pathogen, the host, and the environment. The research with biological herbicides is applied epidemiology whereas the plant pathologists in the past have been primarily concerned with trying to minimize the effect on the host plant (the crop).

We are looking at it in a different way. We are trying to maximize the effect of the disease on the plant (the weed). The same principles apply, but we are looking at it in a slightly different direction. We need a virulent pathogen, an abundant supply of inoculum, a host susceptible to the disease, the host plants must be close enough to one another for spores to disperse from one plant to another and there must be suitable environmental conditions for the disease to develop. We can overcome some of the limitations of disease development by producing large quantities of inoculum (spores) and applying these spores (spray) in specific areas. The environment may be the major constraint since these biological systems are very dependent upon environmental conditions with moisture and temperature very important factors having major impact on the development of the disease on the host species. In our bioherbicide research we are trying to maximize the effect on the host weed population.

Velvetleaf

Velvetleaf is a major weed problem in most of the soybean and corn growing areas and is one of the few weeds in the corn-soybean system that is not at present adequately controlled by herbicides. It is rapidly becoming the dominant weed species in many fields as indicated by Photo 2 which shows Dr. Alan Gotlieb of the University of Vermont in a corn field in Vermont. This is a good example of multiple cropping! Corn, which the farmer had planted, and velvetleaf, which the farmer had also (unintentionally) planted through the application of manure in his field from his dairy production system.

In 1981 Dr. Gotlieb found lesions on velvetleaf, isolated a pathogen and sent it up to me to examine. After some preliminary laboratory and growth chamber experiments a collaborative research program with Dr. Gotlieb was established to evaluate this organism as a bioherbicide. We have evaluated it both in the laboratory and in the field, and I'll give you some of the results that we have obtained.

The pathogen was identified by the scientists of the Biosystematics Research Institute in Ottawa as *Colletotrichum coccodes* and the culture is deposited in the culture collection in Ottawa. As reported in the scientific literature, this fungus has a relatively broad host range. The fungus has been reported from many plants but it has never been a virulent pathogen of these crops. However, our isolate of *Colletotrichum coccodes* from velvetleaf has a restricted host range. The fungus can be easily cultured on artificial media and, through investigation in the laboratory, we were able to find the most appropriate liquid media in which to produce spores. The fungus is very prolific and we can produce enough spores in a litre of liquid to treat one hectare. The liquid material with suspended spores is strained through cheesecloth so that we can concentrate the spores which are added to distilled water and then the spore material is sprayed on to velvetleaf.

We have also looked at the infection process with the scanning electron microscope to observe spore germination. The fungal spores are very small, and after they germinate they actually penetrate through the cuticle surface. They do not require stomata to penetrate into the plant tissue. This information relates to our field application of the fungus as a bioherbicide. We don't have to time our spraying to coincide with stomata opening.

One of my graduate students Christiane Poirier determined the optimum conditions for disease development. The velvetleaf fungus requires a dew period of approximately 12 or more hours to obtain maximum infection. Temperature had less effect on disease development, but it was more rapid with higher temperatures.

In general it has been determined that this pathogen is not severely restricted by environmental conditions and has a relatively wide tolerance range.

With the assistance of Dr. Lee Wymore, a post doctorate working in our lab, we are applying our fungal spore material as we would a herbicide using a herbicide crop sprayer (Photo 3). Photo 4 shows a plot that was solid velvetleaf. The biological herbicide was applied at the one to two leaf stage of velvetleaf — when most materials are being applied for effective weed control — and each one of these little stocks is a dead or dying velvetleaf plant. This is approximately two weeks after application and shows we have very effective control of the velvetleaf using this biological herbicide.

Patent Application

A joint patent application had been made by the University of Vermont and McGill University for the use of the fungus to control velvetleaf. The two universities have recently signed an agreement with a company to commercialize this product as a biological herbicide. This research is within the context of biotechnology as we are using a microorganism to control an undesirable weed species.

How long it will be before this bioherbicide is on the market depends on the development research and registration procedures. It would be very beneficial for the farmer if the product were on the market within three years, but that is very optimistic. It will likely be five years since there are a number of steps required before the product can be made available to the farmers. It will probably be registered in the United States sooner than Canada. As there are no biological herbicides registered in Canada at present, this organism will likely be the first test case for Canadian regulatory authorities. However, there are other biological materials used for insect control that are registered in Canada so there is some precedence to follow.

Other Weed Problems

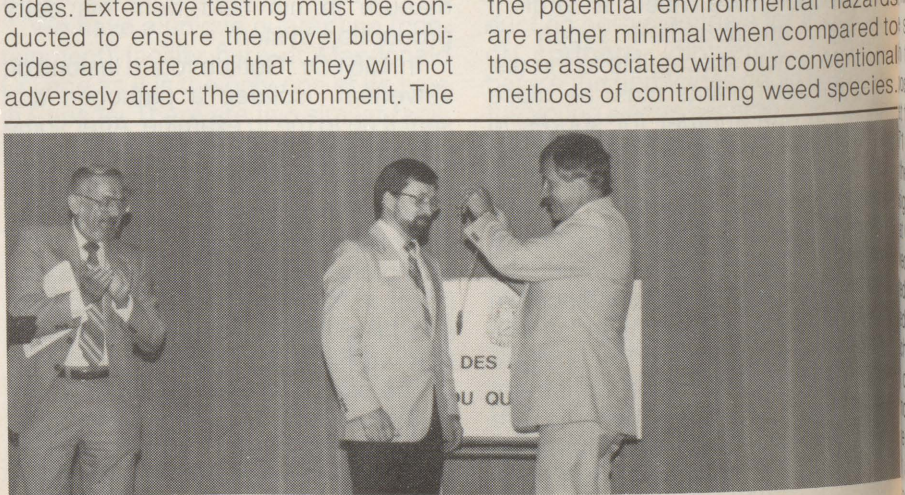
We are also looking at pathogens of other serious problem weed species including quack grass, yellow nutsedge, dandelion, leafy spurge, curled dock, field bindweed, perennial sowthistle, and hemp-nettle.

Possible Constraints

Some of the possible constraints to the use of biological herbicides are biological, technical, economical, and environmental. Biological herbicides are composed of living organisms and are therefore more susceptible to environmental conditions. I believe we can overcome most of the biological constraints. Technology should not restrict the development of bioherbicides as fungal spores can be easily produced in culture fermentation systems that can produce large quantities of viable spores. Economically, it appears that bioherbicides can be produced at competitive prices and should provide economic solutions to many major noxious weeds. As with most types of technological advancements, there are some environmental concerns associated with bioherbicides. Extensive testing must be conducted to ensure the novel bioherbicides are safe and that they will not adversely affect the environment. The pathogens are naturally occurring — we are manipulating something that is already here. From my point of view, the potential environmental hazards are rather minimal when compared to those associated with our conventional methods of controlling weed species.

Photo 3. Fungal spore material is applied using a herbicide crop sprayer.

Photo 4. This plot **was** solid velvetleaf!



Alan Watson, centre, receives the Medal of Achievement of Excellence from the President of l'Ordre des agronomes du Québec Yvan Soucy while Associate Dean Jean David, President of the Ste. Anne's branch, applauds.

A Particulate Medium Grain Dryer and Heat Treater

by Professor Vijaya G.S. Raghavan
Department of Agricultural Engineering

The basic purpose of drying grain is to reduce its moisture content to a level acceptable for safe storage. Drying by immersion in a solid granular medium is a new technique that has been developed and investigated only in the last decade. The operating principle of the system consists of mixing together the crop to be dried and a heated bed of granular material such as sand or salt. Through mixing and agitation high heat transfer rates are achieved and thus fast drying. After proper drying is achieved the crop is separated from the granular material through a sieving process. The whole operation can be either continuous flow or batch type.

The grain dryers available today on the market use air as the heating medium. In these dryers the rate at which air heats the product is very slow (50 to 60 times) compared to the heating of the grain submerged in a heated particulate medium such as sand or salt. Other uses for the agitated bed technique are processing, roasting, puffing, and heat treating.

The use of sand for roasting and puffing is an age-old process which I saw when I was helping my mother in the kitchen during the fifties. The particulate medium heating process is used quite extensively in common households of southern India for making flat rice (beaten rice) and puffed rice starting from paddy (rice kernel with the husk on it). Although I was exposed to this particulate medium heat transfer concept, it was not until 1971 that I had the opportunity to work on the idea. During 1971 and 1972, we designed and built a machine (Figure 1) at Colorado State University which mixed grain with heated salt and separated them in one step using a perforated auger attached to the drum. The machine was used extensively for drying corn and roasting soybeans. It demonstrated that drying could be done in seconds rather than in hours.

It also showed that roasting soybeans was quite effective as was shown through animal feed trials. The main disadvantage of this machine,

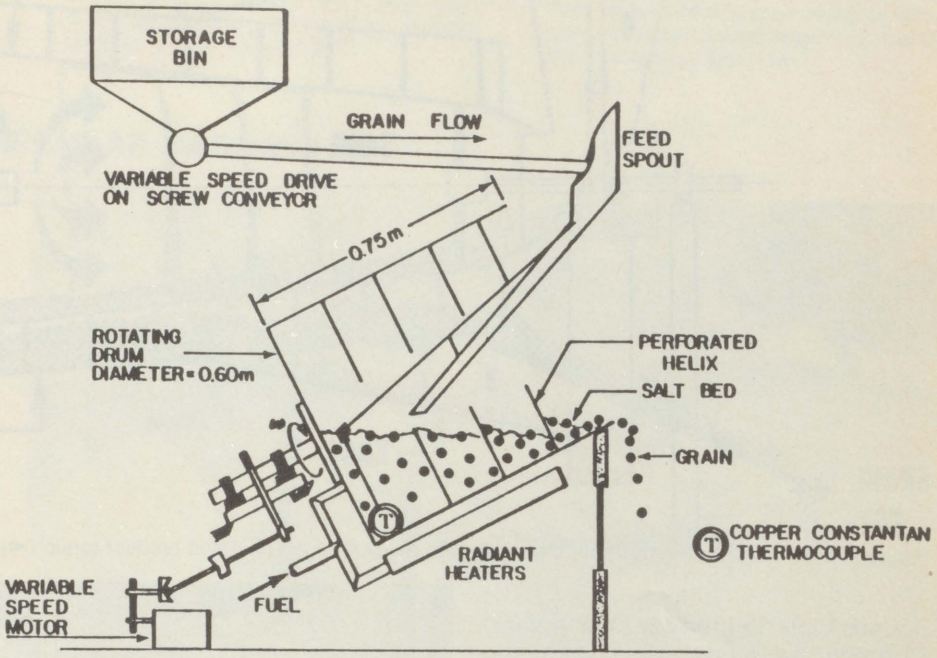


Figure 1. Schematic diagram of the experimental particulate bed heat exchange dryer (Design 1).

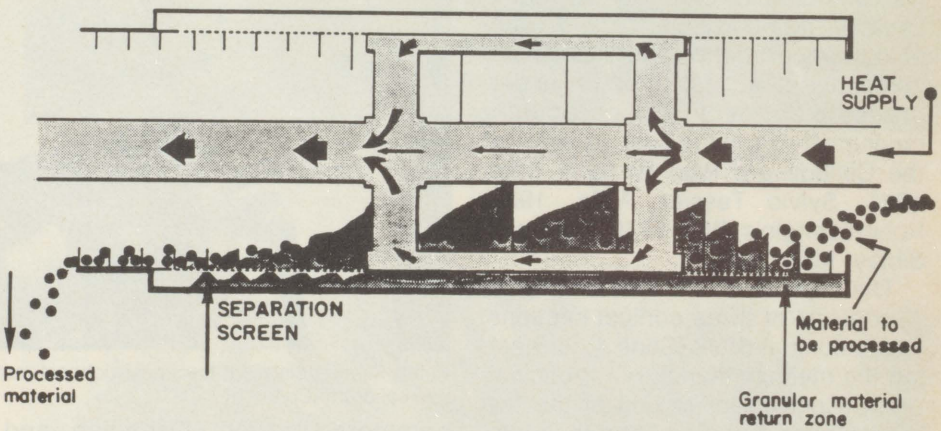


Figure 2. Material flow path in a particulate medium dryer (Design 2).

however, was inefficient heating and heat loss from the drum to the surrounding air.

Since 1978 it has been possible to continue work at Macdonald College on the particulate medium heat transfer concept through the Natural Science Engineering Research Council (NSERC) operating grant funds. In addition to the basic studies, we also designed, built, and tested an improved version of the particulate medium dryer (Figure 2) at the college using sand as the medium. In this machine, flue gases were circulated through and around the drum carrying the medium and the grain. The unit functioned satisfactorily for heating, separation, and drying stages, but it was difficult to maintain steady state temperature conditions throughout the drum.

Later in 1983-84, a third particulate medium dryer and heat treater (Figure 3) was designed, built, and tested during the Masters thesis work of Kulbir Pannu. Mr. Pannu, a native of Punjab State in India, gained several years of practical experience in many industries including Pratt and Whitney of Canada. He joined our Agricultural Engineering Department and obtained his Bachelor's Degree in 1981 and Master's Degree in 1984. After completing the Master's Degree, he worked as a Project Manager at Ven-

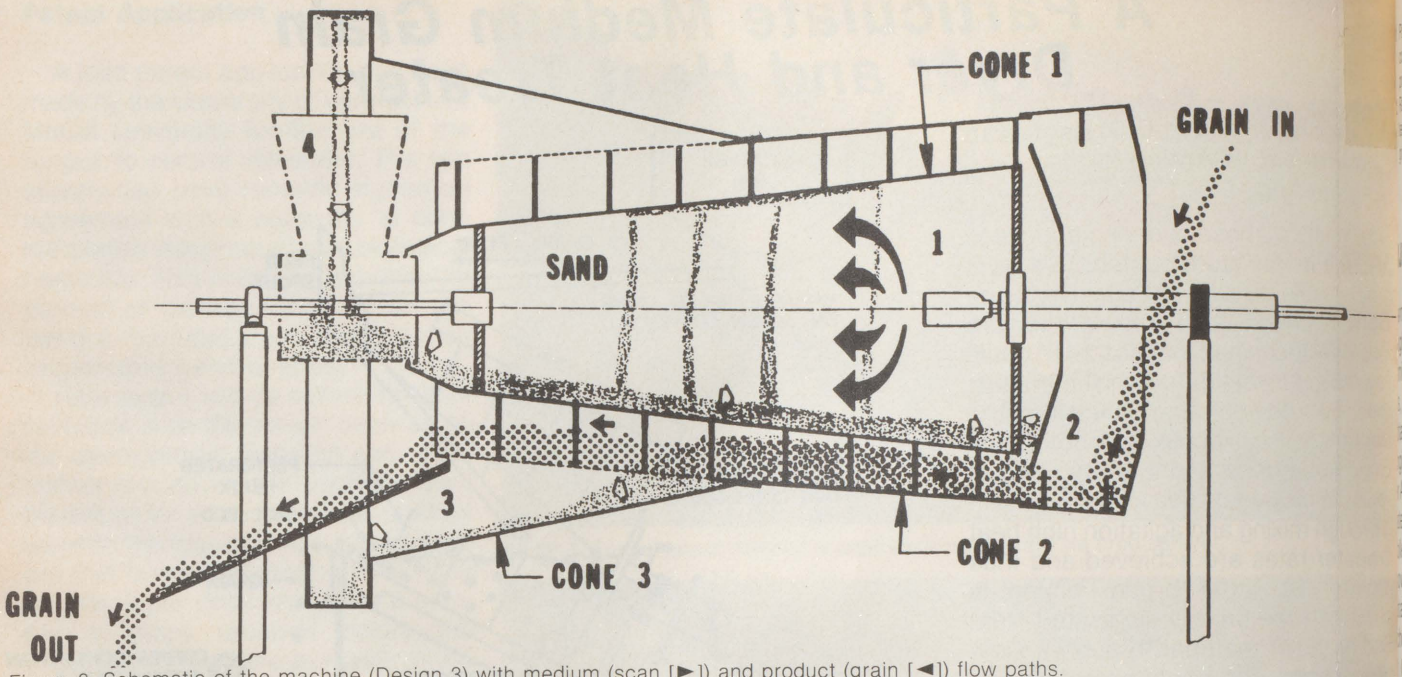
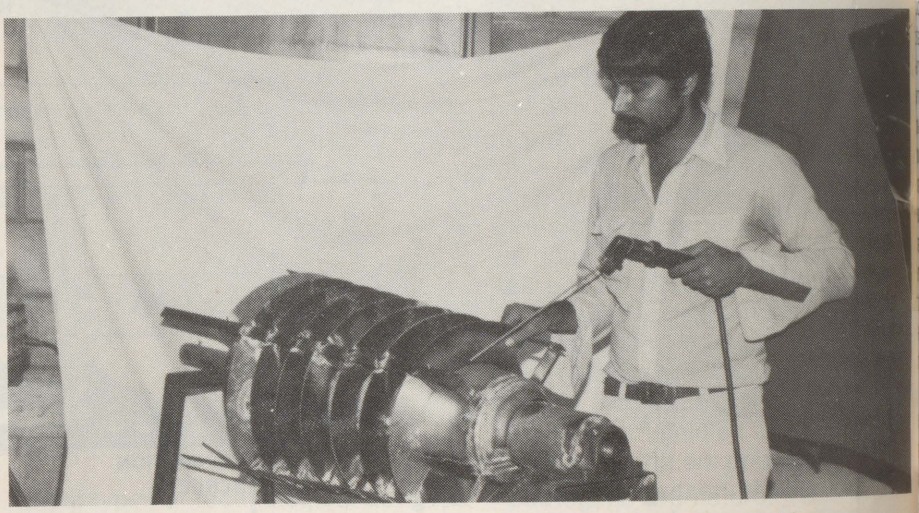


Figure 3. Schematic of the machine (Design 3) with medium (scan [►]) and product (grain [◄]) flow paths.

tilateur Victoria Ltee for over a year. Currently he is taking some courses here at Macdonald and he plans to do his Doctoral Degree at Université Laval in the Food Science and Technology Department. Others who have completed their Masters or undergraduate project on particulate medium dryers in the past six years at the College are Paul Richard, MSc, 1981; Sylvio Tessier, MSc, 1982; Robert Langlois, BSc, 1979; and Kevin Sibley, MSc, 1984.

The dryer and heat treater (Figure 3) consists of three conical sections; inside-conical-drum (Cone 1) for heating the medium (sand), outer-conical-drum (Cone 2) for mixing of the two media (sand and grain) and their subsequent transportation to the separation section, and the last-conical drum (Cone 3) for recirculation of the sand. The propane burner inside the drum is so well situated that it can bring the medium (sand) temperature to 200°C from 10°C in less than five minutes. The hot sand mixes with the incoming grain at 2 (Figure 3) and is transported through the annular space between the conical drums 1 and 2. The primary separation of the two media (grain and sand) is done at 3 and secondary separation at 4. The sand is then recirculated, whereas the grain is fed to an aerator for further moisture removal. The residence time of the grain in the machine is about 40 seconds. This machine shows great potential for commercialization. Canadian and United States patent applications have been made through the help of Dr. Pierre Chollet, Director of McGill's Patents and Inventions Office and the Centre de Recherche Industrielle du Québec (CRIQ). A licensing agreement for manufacturing was also reached between Ventilateur Victoria Ltee and McGill through CRIQ. Pre-production type units were fabricated in Victoriaville and were tested by Kulbir Pannu who was then working there as a Project Manager. Full scale production is expected to get underway in approximately two years.


Kulbir Pannu points out the constructional method of the auger around the inside-conical-drum (Cone 1).

The machine shown in Figure 3 can be used for any heat treating and processing application. Its heating efficiency is between 80 and 85 per cent. The dryer can be manufactured in many sizes and should be possible to use in various farm scale operations. The dryer can also be made as a dual purpose machine both for drying and processing.

Research and development on the particulate medium dryer and heat treater continues at the college through a Doctoral thesis of Zaman Ali Khani for finding a suitable materia enhance mass transfer and also adapt the concept for processing grains before feeding them to animals. Professor Elliot Block of Animal Science and Professor Guy Paquette of Food Science and Agricultural Chemistry are collaborating on some of the interdisciplinary aspects of the project.

References

1. Pannu, K.S. and G.S.V. Raghavan, 1985. A continuous flow particulate medium grain processor. CSAE paper No. 85-200.
2. Raghavan G.S.V. and J.M. Harper 1974. High temperature drying using heated bed of granular salt. Trans. ASAE 17(1):108-111.
3. Raghavan, G.S.V., J. M. Harper and R. Haberstroh 1974. A study of heat transfer using granular media. Trans. ASAE 17(3):589-592.
4. Raghavan, G.S.V. and R. Langlois 1984. Design of a continuous flow tunnel grain dryer utilizing a recirculating granular medium. Drying 84:193-196.
5. Richard, P. and G.S.V. Raghavan 1980. Heat transfer between flowing granular materials and immersed objects. Trans. ASAE 23(6): 1564-1568, 1572.
6. Sibley, K.J. and G.S.V. Raghavan 1984. Parameters affecting grain drying by immersion in a hot particulate medium. Int. J. of Drying Technology. 3(1):1-24.

VIJAYA GRAMA SEETHARAMIENGAR RAGHAVAN

Born in Karnataka State of India, Dr. Raghavan grew up on a small scale family farm which produced rice, lentils, bananas, and coconuts. He obtained a Bachelor's Degree in Engineering (Mechanical) and worked for Agricultural and Allied Industry, Inc. Later he taught Engineering at B.M.S. College of Bangalore University before moving to Canada in 1969. He obtained a Master's Degree from the School of Engineering of the University of Guelph; continued his graduate studies at Colorado State University to obtain a Doctoral Degree in 1973. Serving as a Chief Engineer for a company in Fort Collins, he developed a rose packaging machine. Finally he moved to the Department of Agricultural Engineering in 1974. His current research interests are: heat transfer in granular agricultural materials, conventional and spouted bed drying, the storage of fruits and vegetables, and the effects of soil-machine interaction problems on plant production.

The American Society of Agricultural Engineers recently announced that Professor G.S.V. Raghavan was twice named a 1985 Paper Award winner by that society. His papers "Heat Transfer by Mixing in Solid Media with a Flighted Rotating Drum" and "Performance of a Sand Medium Dryer for Shelled Corn," with authorship by S. Tessier and G.S.V. Raghavan, were published in *Transactions of the ASAE* during 1984. The award was announced by ASAE president James H. Anderson at the annual banquet at Michigan State University, East Lansing, Michigan, on June 26, 1985.

A total of 362 papers were evaluated by the selection committee and only nine were selected for awards. Winners of ASAE Paper Awards are chosen from papers of engineering merit published in any of the 12 issues of the Society's publication *Agricultural Engineering* or in any issue of its bimonthly *Transactions of the ASAE* during the previous calendar year.

Dr. Tony Dexter, I, Waite Agricultural Research Institute, University of Adelaide, Australia, visited Macdonald this past summer and did some work with Professor Raghavan,

Another visitor to Macdonald was Dr. Hans Jorgen Olsen, I, from the Swedish University of Agricultural Sciences in Uppsala.

P.S.

Rational Solutions

As a BSc (Agr) '68 graduate, I read with considerable interest the May 1985 edition of the *Macdonald Journal* featuring "The Financial Crisis in Agriculture."

You dealt with this subject on both a broad based prospective as well as concentrating on a specific recommendation in dealing with this crisis. Your contributors are all known to be certainly offering rational solutions to the dilemna.

Even though I read your series based upon a southern Ontario prospective, there is no question that many points highlighted in that edition have definite merits for further consideration in my extension thrusts here in Kent County and beyond. It would be appreciated if you could send to me three additional copies of that edition.

Barry G. Fraser, P.Ag.,
Agricultural Representative,
Kent County
Ontario Ministry of Agriculture & Food

Related to the Source

(letter to Dr. Roger Buckland,
Dean Faculty of Agriculture)

May I say how much I have appreciated your talk last Saturday at Reunion '85 of the Graduates' Society. I have also immensely appreciated the opportunity and privilege of talking with you Roger and to chat about the "good old days of the classes of '62-'63." This was just great.

I was specifically interested, because of my function with the Quebec Ministry of Agriculture, in the Agricultural Economics Seminar given by Garth Coffin, who, incidently, is also a member of the class of '62, and I feel there are great steps forward from the department as well as from the College to respond more and more to the needs and expectations of the Graduates. We feel this keeps us in many ways "Related to the Source."

I also appreciate the college granting permission to reproduce the Agricultural Economics material from the *Macdonald Journal*, May 1985, in our Regional Office's publication *Gestion et Technologie agricoles* and be assured that I will send you a copy as soon as it comes off the press.

The Department of Agriculture and myself do appreciate the very excellent cooperation that has been developed over all these years with the college, and you will recall as Grant Ross, President of the Macdonald Branch mentioned in his speech: "It is through these projects like Agricultural Economics that we will as graduates keep the Macdonald Spirit more enthused than ever."

My very best regards to you Roger, and best of luck in your new function as dean. I know you will do a great job at it and please be assured that I will do the utmost in all I can to support you.

Louis-A. Bernard, agronome
Extension Specialist
Department of Agriculture

Excellent Series of Articles

I must congratulate you on the excellent series of articles on the Ness family and its long association with Macdonald and outstanding contribution to agricultural concerns both in Quebec and across Canada.

It was my priviledge to have some "fireside chats" with the late Robert R. Ness (R.R. as he was known here) when I first arrived here as a teacher in the early 50s. I found him to be a man of wide interests, one who was very much interested in encouraging young men and women to pursue post-secondary educational careers, and one who was very proud, and with good reason, of the Ness family.

It was through his influence that two of my wife's uncles went on to Macdonald College. Mr. George Muir, the elder of the two, was in the Class of '14. My wife's younger uncle, Ernest Muir, was there some four years later on. His daughter, Jean (Mrs. Donald Roy), was in the Teachers' Class of '39. She, as well as the two previously mentioned, are no longer with us — sadly missed!

It's been many years since I took time to study the old pictures that hung so proudly, and so long, in the long corridors of Brittain Hall.

I haven't read a Macdonald Journal (formerly the Macdonald College Journal, if my memory has not failed) for years. I thought it had been "ploughed under" with so many other things which we remembered from the Mac scene of almost 40 years ago. Is the *Failt-Ye Times* still published? Do Mac types still enjoy singing "All Hail, Macdonald, we sing to thee"?

I haven't had occasion to visit the new Macdonald-Stewart Building, but students tell me that the facilities are first rate. My last visit was with a group of my students (I retired from teaching in '83) from the Lakeshore area back in the days before John Abbott.

Enclosed is my cheque for a subscription to the Journal. With every best wish for the continued success of the Journal.

Eric H. Rumsby
Teachers' 49

A Source of Inspiration

On behalf of the Board and the entire MAB Association I would like to thank you for the excellent article of August, 1985, entitled "Jim Bergeron: Tackling Blindness One Small Step at a Time." in the *Macdonald Journal*. The story is very accurate and should be a source of inspiration and hope for many who are disabled or handicapped in some manner.

Our quality work with the visually handicapped is becoming more and more known by the people of Quebec and consequently an increasingly larger number of clients are coming to us for mobility training, low vision services, education, rehabilitation, and lodging. This past year the numbers coming to us increased to 2,500 from approximately 1,600 the year previous.

However, before they come we believe that public education must sensitize those who are afflicted with some promise of a new life. Your article certainly should give hope and courage to many and we thank you for a first class piece of journalism.

John A. Simms
Director General
Montreal Association for the Blind

Especially the Dairy Articles

I enjoy the Macdonald Journal very much, especially the articles on dairy cows. Having been an ROP inspector since 1981 your dairy articles have been very informative.

James H. Steeves, BSc (Agr) '76
Fredericton, N.B.

Factors Affecting Profitability of Quebec Feedlots

by H.G. Coffin and M. Moisan
Department of Agricultural Economics

(Note: *Information on beef feedlots in Quebec presented in this article is drawn from a survey of 20 beef producers carried out by M. Moisan during the summer of 1982. This survey was part of a research project financed by le Conseil de Recherches et Services Agricoles du Québec.*)

Introduction

The economic viability of fed beef production in Quebec is influenced by several factors, including general market conditions, efficiency of the marketing system, the generosity of government programs, the intensity of regional or international competition, and the performance of the feedlots themselves. The only one of these categories over which beef producers may exert much influence is the performance of feedlots as determined, in part, by the production and marketing decision of the feedlot operator. Even with a strong performance, producers are not assured of a profitable operation; without a strong performance, survival may be in doubt. This article first deals briefly with the characteristics and performance of 20 Quebec feedlots based on a recent survey and then touches upon the other factors influencing the profitability of beef production.

Feedlot Characteristics and Performance

Selected data on 20 Quebec feedlots which were surveyed during the summer of 1982 are presented in tables 1 and 2. The survey covered feedlots ranging in size from less than 100 head to as many as 1,400 head. The average number of head sold for all feedlots in the survey was 440 per year.

The total number of cattle sold in 1981-82 by feedlots included in the survey was 9,195. This number corresponds to three per cent of the total cattle slaughtered at federally and provincially inspected packing plants in Quebec in 1982 and about 13 per cent of all beef carcasses, other than cows and bulls, graded at those plants that year. In other words, the data may be considered representative of a reasonable portion of the industry.

Table 1 provides a summary of costs and returns for feedlots surveyed during the 1981-82 production period. Apart from the purchase of feeders, the major cost items include feed (45 per cent of total costs excluding feeders), interest payments (27 per cent) and depreciation on buildings and equipment (8 per cent). At that time, the revenue from the sale of cattle ($419,676 per feedlot) was less than the estimated total cost ($463,575 per feedlot).

In the absence of the income insurance stabilization program (ASRA) that year, the average feedlot surveyed would have lost nearly $30,000. It would likely have managed, however, to cover most out-of-pocket expenses. With the average net payments of $52,145 from ASRA that year, the average feedlot yielded a net return to family labour, management, and equity capital in the order of $23,248.

Some things have changed since 1982. Interest rates are lower and this would tend to reduce the importance of this cost item, at least on short term credit. On the other hand, feed costs and certain other costs may be slightly higher and there has been very little difference in the prices of fat cattle. Consequently, the net income position of most feedlots may not be much different today that it was a few years ago.

One of the factors which affects the economic performance of the feedlot is the debt load it is carrying as reflected in interest payments. Another is the efficiency of the operation with respect to economies of size. Still another is the performance of the operation in terms of feed conversion

Table 1. Average costs and returns for 20 beef feedlots in Quebec, 1982

		Per feedlot	Per head sold	Per CWT of beef produced[e]
		(dollars)		
(A)	**Average variable costs**			
	Feeders Purchased	205,670	467	74.27
	Feed — Homegrown[a]	88,084	200	31.81
	— Purchased	29,223	66	10.55
	Interest — Short term	43,561	99	15.73
	Income Insurance Premiums[b]	15,002	34	5.42
	Other variable costs[c]	24,248	55	8.75
	Total variable costs	405,788	921	146.53
(B)	**Average fixed costs**			
	Mortgage interest	25,987	59	9.39
	Depreciation — Machinery	16,110	37	5.82
	— Buildings	4,158	9	1.50
	Other Fixed costs[d]	11,532	26	4.16
	Total Fixed Costs	57,787	131	20.87
(C)	**TOTAL COSTS (A + B)**	463,575	1,052	167.40
(D)	**REVENUE** — Cattle Sales	419.676	954	151.56
	— ASRA	67,147	153	24.25
	— Total	486,823	1,107	175.81
(E)	NET RETURN TO FAMILY LABOUR, MANAGEMENT AND EQUITY CAPITAL (D-C)	23,248	55	8.41

[a]Estimated market value
[b]Premiums paid at that time were $42 per head, but some animals were not insured.
[c]Includes hired labour, veterinary expenses, trucking and other marketing costs, bedding, and pesticides.
[d]Includes insurance, taxes, and miscellaneous.
[e]Weight gained on feed.

and other physical input-output ratios.

As in most sectors of agriculture, it is difficult to generalize or draw strict conclusions about profitability conditions. Some managers seem to prosper even in difficult times; others may experience losses due to unfavourable circumstances, regardless of their management skill. Of the 20 feedlots surveyed in 1982, 12 apparently suffered losses, some of them substantial, while the remaining eight turned a profit, some of them substantial.

Despite the risk of generalizing, it can be said that, under today's conditions, feedlots with less than 50 per cent equity may have difficulty repaying their debts. The average equity position of feedlots surveyed in 1982 was about 50 per cent equity but the top five performers in terms of profit averaged 66 per cent equity. Those with low equity were carrying large debt-service charges.

Part of the difference in performance of Quebec feedlots can be attributed to efficiency with respect to economics of size. For illustration, the feedlots surveyed were divided into three size categories and selected data were tabulated for each category. These are summarized in Table 2.

The bottom line in Table 2 reveals that, on average, the five smallest feedlots (less than 200 head) lost $39.32 for every hundredweight of beef produced in 1981-82, while the five largest feedlots (500 head and over) had a net return of $17.14 per hundredweight of beef produced. The 10 mid-sized feedlots (201-499 head) averaged net returns just above the break-even line.

This large difference in performance between the largest and the smallest feedlots, amounting to $56.46 per hundredweight of beef produced ($340 per head) is only partly due to more efficient use of capital. Although the ratio of capital (land, buildings, and equipment) per head marketed is almost three times as high ($2.43) for the smallest feedlots as for the largest ($0.85), the difference in total fixed costs between the two categories is only $17.41 per hundredweight of beef produced. The remaining 70 per cent of that difference shows up in short term interest ($17.38), feed costs ($9.69), other variable costs ($2.26), and ASRA payments ($4.48), none of which is necessarily related to the size of operation.

The smaller operations actually registered a lower cost of feeder cattle at $69.91 per hundredweight of beef produced versus $76.17 for the largest feedlots. Similarly, they recorded a slightly higher average daily gain for cattle on feed. As might be expected, the equity position of the smaller feedlot owners was higher than that of the largest, but the difference was less than four percentage points.

Government Programs

The government of Quebec, through le Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ) has committed many millions of dollars to the development of the beef industry in Quebec over the past several years. One of the major programs dedicated to the development of fed beef production is a capital grant of up to $50,000 to establish a feedlot operation. Another of considerable importance to many producers is the income stabilization insurance program (ASRA). Subsidized interest rates on loans made by l'Office du Credit Agricole, subsidized veterinarian services, and a variety of other government programs also represent a measure of support available to the beef industry. Based on survey results, the average amount of subsidy (including ASRA) received by feedlots during the six years prior to and including 1982 was in excess of $100,000 per feedlot. Most of this occurred in 1981-82 when ASRA payments alone averaged nearly $130 per head on a net basis.

The existence of these programs may assist some producers to establish a viable operation or survive economic hardship in the short run. But there is also a risk that they provide just enough incentive to lead some producers into financial difficulty, particularly if they are induced to borrow large amounts of capital to enter the business or expand at the wrong time. In other words, these programs may disguise or overshadow the signals coming from the market place, thereby encouraging some producers to make wrong decisions for the longer term. Dependence on government programs for survival could leave many operations vulnerable if and when these programs are changed as could happen with income stabilization, for example. The industry must be prepared for the eventuality of reduced support from government.

Table 2. Selected characteristics and performance data for Quebec feedlots according to size, 1981-82

ITEM	SIZE OF FEEDLOT (head) up to 200	201–499	500 and over
Number of feedlots	5	10	5
Average number of head sold	150	320	1,097
Average capital values ($,000,/feedlot)			
Land and Buildings	300	319	781
Machinery and Equip.	64	125	155
Cattle	106	230	525
Total	470	674	1,461
Equity position (%)	51.3	51.6	47.6
Physical performance (pounds/head)			
Average entry weight	531	538	579
Average exit weight	1,160	1,164	1,180
Weight gain of feed	629	620	601
Average daily gain	2.28	2.28	2.05
Production costs ($ per cwt. of beef produced)			
Feeder cattle	69.91	72.26	76.17
Feed costs	53.62	37.96	43.93
Short term interest	31.62	16.65	14.24
Other variable costs	15.67	12.62	13.41
Total variable costs	170.82	139.49	147.75
Total fixed costs	31.51	29.31	14.10
Total costs	202.61	169.02	162.00
Returns — Cattle Sales	145.03	146.05	156.40
— ASRA Payments	18.26	25.60	22.74
Net income	(39.32)	2.63	17.14

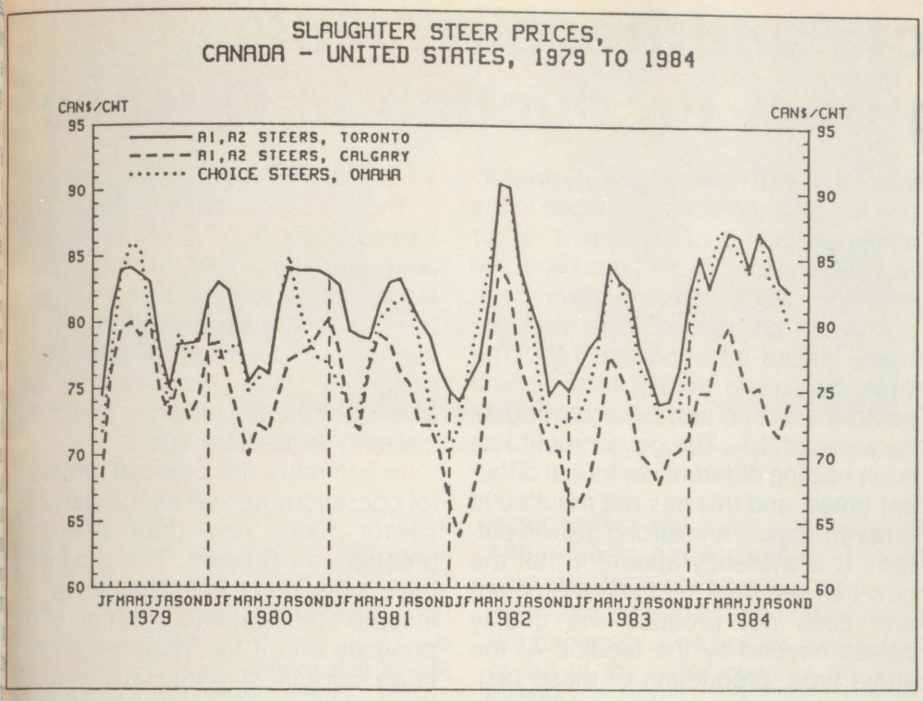


Figure 1. Source: Agriculture Canada, Market Commentary.

General Market Conditions

The past few years have not been the most prosperous times for the beef industry. The effects of a weak economy and a slow growth in income have been compounded by an apparent change in consumer preference, resulting in a weakened demand for beef. This shift in demand has been further reinforced by an increase in the availability of substitutes such as pork and poultry.

The effect of these changes in consumer demand has been weak prices, serving as a signal that the market wants less beef. Even with producers in most parts of Canada and the United States responding to that signal by gradually reducing production, beef prices have not shown any real improvement for some time. In fact, as may be seen in Figure 1, slaughter steer prices in both Canada and the U.S. have remained relatively flat, apart from seasonal variation, for at least the past six years. When inflation is taken into account this means that *real* prices have actually declined. Without the support of government programs, it is unlikely that Quebec producers would have expanded their output of top quality (A1, A2) beef from 7,334 head in 1978 to 74,644 in 1984. It is an extremely remarkable increase that comes at a high cost in a declining market.

Other Factors

As noted at the beginning, the inability of fed beef production in Quebec is also influenced by regional competition and the efficiency of the market system. The primary competition for Quebec feedlot operations is situated in Ontario and Alberta which have traditionally supplied the majority of the high quality beef market in Quebec.

The main cost differences are most likely to appear in feed and in the price of feeder cattle. Beef feedlots in Ontario have about the same total feed costs as those in Quebec. Both provinces, based primarily on corn silage, have higher feed costs, by about $7 per hundredweight of beef produced, than feedlots in Alberta where barley is a major ingredient.

Many Quebec feedlots have been purchasing their feeder cattle replacements in western Canada. In fact, the movement of cattle and calves from western Canada to Quebec has increased from 4,114 in 1980 to 31,055 in 1984. The cost of transporting these animals and losses due to shipping represent an added cost to Quebec producers.

While Quebec producers face higher costs, they also receive higher prices than their competitors in western Canada. The amount of that price difference varies from time to time but generally reflects the cost of transporting carcass beef from Alberta to Quebec. This difference is tending to increase more slowly than that of production costs, contributing to the potential for more intense regional competition in the future.

The marketing system which connects consumers with the farm gate in this case includes meat packers, truckers, retailers, the food service sector, and others. The retail sector has generally shifted its merchandizing emphasis away from red meats in favour of fresh produce. There is some evidence that this shift has been accompanied by an increase in retail margins, resulting in a wider price spread between producers and consumers. This may have the dual effect of reducing the volume of beef consumed as well as lowering producer incomes through both price and volume.

Meat packers have experienced the economic pressure associated with declining volumes and the concentration of buying power at the retail level. There have been a number of plant closings and other measures of consolidation across Canada over the past few years.

One concern that some producers have expressed regarding the marketing system in Quebec, however, is that eligibility for government programs such as income stabilization requires the producer to sell to Quebec packing plants. In areas such as western Quebec where producers would ordinarily have the option of selling to Ontario plants, this provision has the effect of reducing competition in the packing industry and may result in lower prices paid to producers.

Conclusion

Beef producers throughout North America have experienced difficult times for the past several years with sluggish markets and rising costs. Income stabilization insurance and other government programs in Quebec have helped to disguise those conditions and to encourage an increase in production in this province. But serious beef producers must consider market conditions and regional competition among other factors in making long run production decisions.

Prospects and Requirements for Increasing Beef Production in Quebec

by Henry Garino
Department of Animal Science

In 1978 the Government of Quebec unveiled a plan to increase feedlot production from approximately 20,000 head per year to 110,000 by 1982. This plan has fallen short of its objectives since it never reached that goal. Feedlot production in 1984 consisted of approximately 70,000 head.

In November 1984 the Government of Quebec developed a triennial plan designed to increase production of calves and conservation and utilization of feeds destined to fatten these calves. The aim of this plan was to increase the beef herd by 25,000 head by 1986, which would result in an increase of the same order in the number of steers fattened at the feedlot.

These incentives to produce more beef obviously indicate a governmental belief that the Quebec market either is able to consume this extra production or that it will result in a parallel decrease in beef entering the province from elsewhere. I am more in agreement with this latter view. At any rate, this extra production surely must be slaughtered within the province and my opinion is that we have more than adequate facilities to slaughter and process even larger numbers of cattle.

At this time, one could reflect as to why steer and heifer (grade A) production has not increased in Quebec to the levels predicted and taken a larger share of the quality beef market of the province. Many reasons have been postulated, and most of them have certainly played an important role. The beef industry is made up of several sectors and can only be as strong as its weakest link. The government has been helping different sectors at different times, and this has not resulted in an even, logical and strong growth pattern. It is evidently apparent that the cow-calf sector is relatively inefficient and does not produce the quality calves needed by the feedlot. At the same time, production of these fast-growing crossbred calves so much in demand may not be the ideal type of animal to be produced by relatively new and inexperienced cattlemen whose main concern should be reproductive soundness. Thus, the increase in feedlot numbers from 1978 to 1985 has been mainly due to an increase in the number of calves brought in from western Canada rather than from Quebec born calves.

The feedlots also have had their share of problems, mainly in health, marketing, and excessive capital investment in buildings and equipment. The technical support staff to counsel these new producers is evidently in very short numbers in the province.

The slaughter/packer sector has had to upgrade its facilities to meet new regulations and this has caused large sums of money to be invested in this tightening up procedure. At the same time, new slaughter plants have been built in a province that was already operating at 55 per cent of full capacity in the late 70s.

In summary the cow-calf and feedlot operations as well as the slaughter sector have had their share of problems in Quebec. The producers have been kept in business by the income stabilization insurance of the province and if this program ends, a large portion of producers with low equity will have to go out of beef.

As far as prospects for expansion go, consumer demand for beef is shrinking in North America and so is the breeding herd. To counteract this trend more publicity on the merits of beef as food and more imaginative retailing of beef cuts to fit changes in consumer needs are a must. If this can be accomplished, there may be a place for high equity, efficiently managed cattle operations which will at least replace the ones that won't stay in business. These operations will have to compete with beef coming from outside the province for a larger share of the Quebec market.

A Commercial Viewpoint

Maximizing Returns from the Cow Herd

by Rodney MacLaren
Adapted for the Journal
by Henry Garino
Department of Animal Science

I have been operating a cow-calf herd in eastern Ontario for 10 years now, and I am still in search of those elusive "profits" we keep reading about. Yet somehow we have always made it to the next year and managed to keep going. If one looks back over the past years of increased production costs and diminishing real returns, one has to have been making progress just to stay where you are.

Where has that progress come from? It has not been from a real increase in calf prices. There is very little one can do to increase prices beyond better marketing. Some progress has come from reducing costs, but there is a limit to this option, so what can be done? The answer lies in increased production per cow. This means not only more pounds of weaned calf per cow but, more important, more pounds weaned for every cow bred. Cows that lose a calf or don't rebreed cost money and their cost has to be carried by the other cows. I look at production efficiency in terms of the number of pounds of calf weaned per bred cow, and it must be built into your herd through genetic improvement in your cows.

With this in mind, I will outline my cow-calf operation and explain how it has evolved and how we have improved our cow efficiency.

Cow Herd and Forage Program

My cow herd is currently at 300 cows, 80 replacement heifers, and 15

Henry Garino, I, Rodney MacLaren, and then Dean L.E. Lloyd at last year's Farm Days at Macdonald.

bulls. It started in 1975 with 50 cows and increased to a high of 380 cows in 1981. Cows were sold in 1981 and 1982 to help cover higher costs than revenue. During 1983 and 1984 we were able to cover costs and break even.

This herd is carried on 1,900 acres of heavy clay land. We grow all our own feed except for a bit of grain used to supplement the younger cows and heifers. The feed is put up as hay, grass silage or grain silage when a cover crop is harvested. The grass silage is stored in a pile and covered with plastic and tires. The hay is made using large round bales. On an average year, we will make 600-700 round bales and put up 2000 tons of silage from 500 acres. The rest of the land is used as pasture.

The forage is mostly timothy and birdsfoot trefoil. It is on this forage resource, "medium quality grass silage, hay, and pasture," that the cow herd must produce. Our land base and management can economically produce average quality forage and this dictates the type of herd that we keep.

First, look at the quality of forage you can grow, then for the breed of cow that will be able to perform on that quality of forage.

Management of the Herd

The cows are divided into three groups:

1) heifer calves (replacements);
2) 1st, 2nd, 3rd calvers;
3) 4th calvers or five year olds and up.

This is done so that the different age groups can be managed separately at feeding and breeding. During the winter the younger cows and replacement heifers are given priority on the better quality hay and silage. They are also supplemented a small amount of grain and protein if feed tests indicate the necessity. The poorer quality feed is fed to the older cows in the early winter.

In the middle of March, all cows are given a booster shot for scours, a shot of vitamins ADE, and they have their I.D. tags checked.

Calving begins the middle of April. As soon as calving starts, daily feeding is moved to just before dark. This simple change in routine has been very effective in preventing nighttime calving. The cattle are checked at dawn, mid morning, afternoon, and before dark. We use horses to check and handle the cows. With a good horse, a cow and calf can be moved to another pasture or back to the barn if there is a problem.

New calves are tagged, given a shot for selenium and vitamin "E," checked to ensure they have sucked, then moved to a separate pasture away from the cows that have not calved. We have had good success in preventing scours by ensuring new calves and mothers have room to spread out and can get some natural shelter in gulleys or bush areas.

Some grain will be fed along with a mineral and vitamin premix until the cows are on permanent summer pasture. This may be anytime from mid May to the first week in June, depending on the progress of pasture growth.

Before the cows are put on summer pasture, they are tagged with face fly tags and receive a shot for leptospirosis. At the same time, calves are given a shot for blackleg, dehorned, implanted and cost rated.

The herd is organized into three breeding groups as mentioned before. Each group is bred to bulls selected with a specific objective in mind which I will explain further on. The bulls are released July 5th and removed August 25th for a 50-day breeding period. Bull power is one bull to 25 cows. This is important so that as many cows as possible are bred on their first heat.

Preconditioning comes next and it is done two to three weeks before weaning. It involves the following: injections for shipping fever; ITEME: worming; warble treatment and reimplanting the steer calves. The cows and calves are fed hay while on pasture for the last two or three weeks before weaning. This familiarizes the calves with hay and helps to get them started on feed, easing the stress of weaning.

When the calves are weaned, the cows are all pregnancy checked and sorted into wintering groups ready for another cycle. The yearling heifers are given their initial scour vaccine at this time, pregnancy checked, and grouped with the first and second cows.

Production Criteria

The production criteria that we use are as follows. Each cow must:

1) calve and start her calf on her own;
2) rebreed in a 50 day breeding period;
3) wean a good calf.

If the cow can not calve on her own or her calf needs assistance to get sucking, she will be culled in the fall. By taking a hard line on this criteria, our weaned calving percentage has moved steadily up each year. It has gone from 80 per cent in 1979 to 92 per cent in 1984. When I say that the cow must start the calf on her own, I mean that the cow and the calf have to work it out so that the calf gets sucking on its own. What I am looking for here is vigour in the calf and mothering ability in the cow. Both are critical for survival and if you don't select for it, the problem will become worse.

Once the bulls have been put on, the cows then must be bred in 50 days. With our set-up, having the cows out in the open all the time and given the weather conditions most springs, we don't like to start calving much before the middle of April. Cows that calve any later than May 25 haven't enough season to raise a big enough calf by November. Allowing them in the herd

drags out the calving and cuts productivity. By removing the bulls after 50 days, any cow not bred will be culled during fall pregnancy checking.

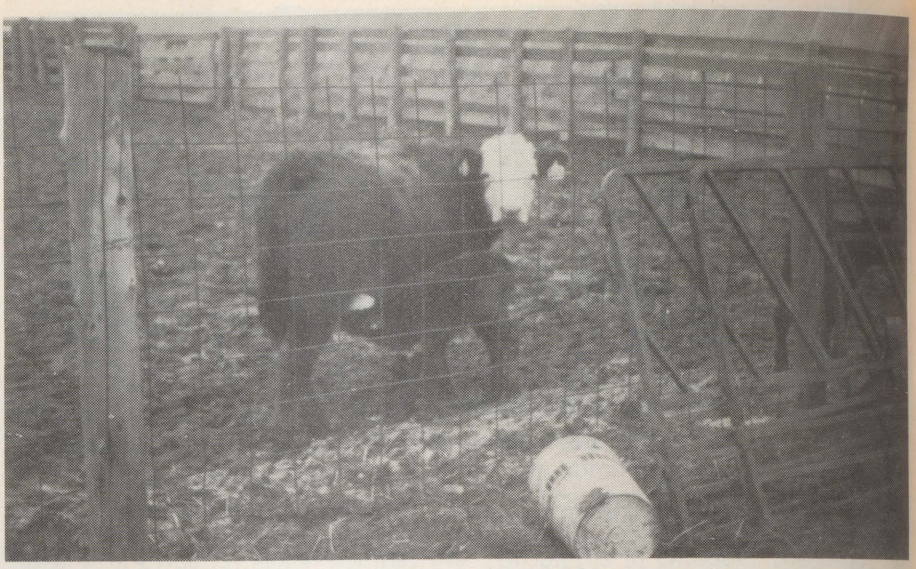
The third criterion is very simple. Each cow weans a calf to sell or gets sold herself. She either generates income from her calf or she becomes income. Before a cow can be culled for producing a poor calf, the cows that did not wean a calf should be culled. We usually sell these cows in early September. Next to be culled are the cows that did not rebreed, then the ones that had problems at calving and, in addition to these, there are some that may have bad feet, a bad udder, or some other problem. By this time, we have culled at least 20 per cent of the herd and still not culled any poor performers with small calves. The point I want to make here is that unless you are prepared to replace more than 20 per cent of your cows each year, it is very difficult to select for your good cows by culling the poor ones. In other words, it is very hard to improve your cows by culling. This means any real improvement in the cows must come from selecting bulls that produce superior cows. It was this realization that paved the way for much of the improvement we have made in our herd over the last five years.

Re-evaluation of Objectives and New Breeding Plan

Up until 1979 my cow herd was predominantly Hereford cows with some Charolais crosses and a few Simmentals and other exotic crosses I was trying. At that time I was interested in crossbreeding because I knew I could get bigger and growthier calves, but I was not sure which exotic would be best suited to my operation.

The Charolais cross calves were bringing the best returns so I was using Charolais bulls on my older cows. These bulls were selected for growth using average daily gain (ADG) as the main criterion. My younger cows and heifers were bred back to Hereford to produce replacement heifers. Again the bulls were selected on ADG and some assurance from the breeder that they came from a good cow. This system, while producing good growthy calves that marketed well as yearlings, had some problems:

1) I was not getting enough weaned calves, only 80 per cent;



A heifer only stays in the herd if she looks after her calf. This one is doing the job.

2) My cows were not rebreeding well, especially the first and second calvers that had Charolais or exotic in them. I was having to replace at least 30 per cent of the cows each year with replacement heifers that were not staying in the herd;
3) The bulls I had been using, selected for ADG, were producing good growthy stockers, but they were not giving me good replacements, nor was I getting enough weaned calves from them bred to my Hereford cows.

At this time I had the opportunity of renting more land. If I decided to do this, I had to either expand my yearling and backgrounding program, which I was running along with my cow herd, or keep more cows. Cows looked to be the better option at that time as calf prices were on the way up. Consequently, it was decided to expand the cow herd from 130 to over 300 cows.

Given the problems we had been experiencing in our breeding program up to that time, it was decided to re-evaluate our objectives and develop a new plan. We decided the new plan had to do several things for us:

1) Enable us to produce our own replacements;
2) The replacements had to come from bulls selected to produce good mothers. These bulls must be identified for their ability to produce maternal cows;
3) Use bulls selected for growth, to breed the cows not needed to produce replacement heifers;
4) Use crossbreeding in the overall program to make the best use of the added fertility and growth that comes from heterosis.

The breeding program developed is dependent upon being able to purchase bulls that are identified and selected for their maternal breeding value. The plan is as follows: The herd is divided into three groups for breeding: **Group 1** The yearling heifers; **Group 2** 1st, 2nd, and 3rd calvers; and **Group 3** 4th calvers and older.

Groups 1 and 2, or the 1st, 2nd, and 3rd calvers, would make up approximately 50 per cent of the herd. These cows would be bred to bulls selected for maternal characteristics. Nearly all the heifer calves from these two groups would be kept for replacements.

Group 3, or the mature cows, will be bred to terminal bulls selected for growth.

Using this system, the replacements are coming from the younger cows which should be genetically superior to the older cows and, therefore, more productive. In addition, the bulls in the maternal strains have had pressure for easier calving, so ease of calving and calving problems should be minimized by using these bulls on the younger cows.

The mature cows, being five years and older, are better able to handle a calf from a bigger terminal type bull at calving. They will also have more milk production than a younger cow to feed a bigger terminal type calf.

By rotating the type of breed used in the maternal groups, a further crossbreeding or heterosis advantage can be obtained. This can be achieved by

changing the breed of maternal bulls used every three to four years. The end objective is to have a cow that is a cross between three maternal breeds. This crossbred cow is maintained by breeding her back to whichever breed she is least of. These cows, once mature, are then bred to a fourth breed which is the terminally selected bull for a further boost in production.

As I mentioned earlier, this whole program is dependent upon being able to buy bulls that have been identified for separate maternal and terminal traits. Beef Booster Ltd., an Alberta company, has been developing maternal strains of cattle since the early 1970s. I liked what they were doing and their approach to selecting genetically superior cattle under commercial ranching conditions. The maternal bulls I have been using come from Beef Booster strains. By using these maternal bulls to produce my replacement cows, I can improve the quality of cow in my herd and develop a more functional cow. In addition, 90 per cent of my selection is done outside my own herd. The genetics and traits I want come in through bulls that have already gone through a tough selection process for their desired traits, be they terminal or maternal.

This may all sound complicated and like a lot of additional work but, in reality, it is not. The only work is in the planning, otherwise it is just bulls on the cows as usual.

When I started this plan in 1979, it seemed like a good idea. Everything I read on crossbreeding indicated that such a breeding program would give me more productive cows and up to 20 per cent more pounds of calf from these crossbred cows. The calf crop from this past year indicated that this is happening and our breeding plan is working well. Since 1979:

1. The average weaning weight has increased 440 to 498 lbs. up 58 lbs;
2. Number of calves weaned has increased from 80 to 92 per cent;
3. The number of open cows has fallen from over 11 per cent to below seven per cent;
4. The pounds of calf weaned per bred cow has increased 104 lbs. or 30 per cent;
5. It will be 1988 before the mature cows in the herd are changed.

Building profits into the cow herd comes from working at all phases of management. Management of the breeding program is one area that takes very little extra physical work but does require considerable thought and forward planning, especially if crossbreeding is involved. Having established what you want to do, you have to figure how you will do it and where you will be 10 to 15 years later. This is particularly important in order to maintain the hybrid vigour and improved reproductive performance of a crossbred cow.

By implementing a plan to improve productive efficiency of the cow herd and hold cost to a minimum, I have been able to wean 30 per cent more pounds of calf for every calf weaned. More important than this though is the fact that I am producing 100 pounds more calf from every bred cow. In addition, I expect to increase that another 50 pounds within three to four years as the plan matures. With continued work on the cost per cow and a bit of co-operation from price, I may yet achieve those elusive profits.

Challenges to cope with

WE ALSO OFFER YOU AGRICULTURAL LOANS GUARANTEED BY THE QUEBEC GOVERNMENT

In Agriculture, there are daily challenges. To cope with these means hard work for you and sound financial planning.

The First Bank Agri-Services offer you a complete program of farm financing and management to:

- increase your farm income
- control your operating expenses.

The First Bank Agri-Services . . . . . the protection of your farming business.

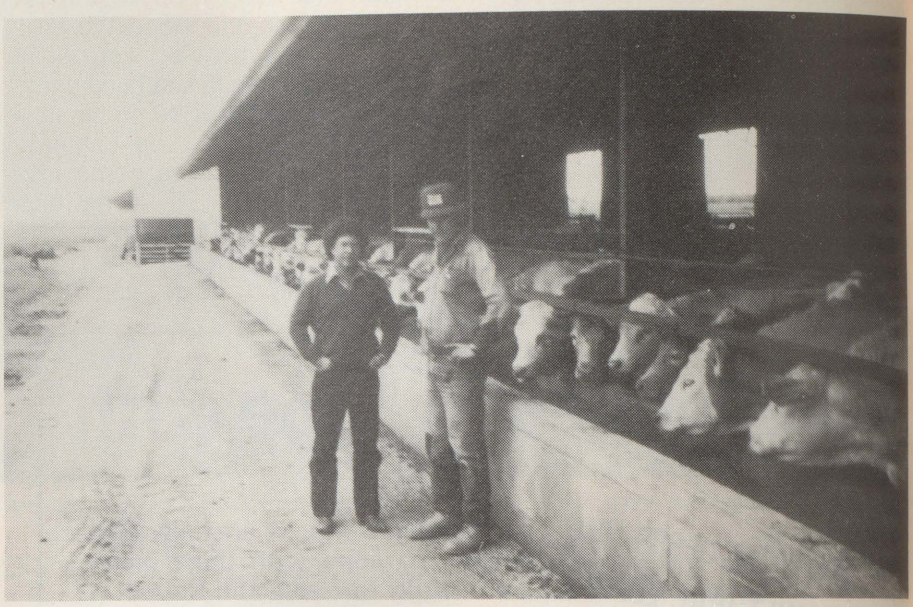
Come and see us !

TOGETHER

FirstBank Agri-Services
Bank of Montreal

The State of the Art in Beef Production

Since 1977 Orance Mainville has been operating one of Quebec's largest beef feedlots in Farnham. Orance is no stranger to Macdonald; he has taught in the Diploma program and worked for the Dairy Herd Analysis Service (DHAS). Henry Garino of the Department of Animal Science visited Orance recently for this interview for the Journal.



Henry Garino, l, and Orance Mainville checking on a pen of western cattle in a slatted-floor barn.

Henry Garino *Back in 1978, you were interviewed for the Macdonald Journal on the state of the art in beef production in those days in Quebec. Now we are in 1985; seven years have gone down the road. What has been happening since 1978 in terms of beef production in Canada, particularly in Quebec, in your opinion?*

Orance Mainville In Quebec from 1978 to 1985 we have seen a very slow growth of the beef feeding industry. We have always had the potential to produce more beef and with the help of the government this has been realized. This growth has not been as high as we expected mainly because national, and/or international markets have been shrinking. Production of beef has been cut pretty well already, but we have not as yet finished the job. We have to adjust to a per capita decrease in demand. Quebec has gone to slow growth during this period in spite of all the government incentives and of the potential it has to produce more. We face a situation in Quebec where plenty of resources are available in farming, but the country is over-producing and therefore we do not know what to do with these resources. By this I mean fertile land that could produce crops and those crops have to be converted to some kind of edible product. The first thing we have in mind, of course, is meat, either hogs of beef. The direction that has been taken was toward beef but slowly.

Henry Garino *I remember back in 1978 when you and I were at the Socio-Economic Conference on Beef Production in Sherbrooke and the Quebec government wanted to put into play some policies that would increase self-sufficiency in beef. What policies has the government put into effect and have they worked?*

Orance Mainville I think that the government had some very general objectives which sometimes were not presented in the right way. To increase self-sufficiency in beef is one thing and it is fine, but on top of that if we could export and make money out of it, we might as well have done that. Since 1978, even though the government has given such incentives as transforming barns into feedlots and guaranteeing revenue, growth has been small. Some of it has come from dairy farmers switching to beef to remain in animal production. Prior to those incentives we were feeding 25-30,000 head and now we are running 75,000. This is the capacity of two feedlots in Alberta. Therefore, in Quebec we have a small industry, but it is getting organized.

Henry Garino *Lately the price of fat steers has really gone down. Does that have anything to do with changes in consumer demand or in alternate products such as cheap broilers or hogs? Does it have anything to do with imports from the US or the EEC?*

Orance Mainville Basically, as an industry we have got to realize that the demand for beef or meat, in general, especially hogs and beef is decreasing. This is normal because it is not necessary to consume 100 pounds of beef per year to live a good life, so we have to face this new reality. During the past four or five years the industry has adjusted to that. The number of cows in the national herd decides what is going to come up in the market. As of today the number of cows indicates that we will have 15 per cent less beef in the market two years from now. The dairy herd is also decreasing because it takes less cows to produce the same level of milk and this also affects the supply of meat.

It is hard for an industry to adjust to shrinking markets. We have seen this in the car industry and many others. It has been tough in beef, but we have to face reality. It is always nicer to work a market where you increase the amount of your product rather than one where you have a decrease in demand. Everybody is upset under the present circumstances but we are living a short-term situation which is pretty dramatic. Things are changing fast. We have a lot of economists, and they do a lot of predicting. What is different now than it was maybe 10 or 20 years ago is that everybody listens to the economists. At the beginning of the year, economists and specialists in the field were saying that we were going to have a bonanza year and that everybody was going to do well this year. So producers reacted — everybody had a lot of cattle, and they kept

them for the good times to come. We have ended up selling less cattle than last year, yet we are overproducing because carcass weight has increased 40 pounds. We had not considered that with genetic improvement we can put an additional 30 pounds on a carcass and still achieve top grade. This allows for more flexibility in marketing decisions because you can hang on to cattle a little longer while waiting for a better market. Because of this flexibility and of predictions of better markets if producers react the same way, the opposite is going to happen, and this is exactly what is happening today. Twenty years ago predictions seemed to come true, but today with all the market information we have things are not the same. We are currently facing a situation that nobody had predicted, and it is going to take some time to get out of it. Everybody is really hurting. There is another aspect of the present situation that is peculiar to Quebec. This is the high concentration of power at the retail level. Three major companies are responsible for distributing most of the food. In fact, one company feeds 40 per cent of Quebecers. This represents about two million clients. As a result the competitive forces in the market are not doing as much as they should. The price of meat at the store should be much lower than it is right now. Markups on beef and pork, especially beef, have gone up tremendously. Retailers do not even have to care any more because they control the market; they have so much power and I don't know how we are going to correct this situation. Government incentives have indirectly, perhaps, lent a hand for this situation to develop. Beautiful, large, important companies being fancier were the order of the day. I think it has been a serious mistake to allow competition to have eroded as it has.

At the national level every time we get involved in international trade we seem to be the poorest negotiating partner. This may be due to the general policy in Canada of cheap food for the important consumers. This year when it was predicted that beef was going to go up and the government had a chance to get cheap subsidized beef from the European Communities' surplus, they did, so that the consumer would get cheaper meat. This is very unfair to us producers, because it is not fair competitive trade when you are dealing with subsidized meat from the EEC built up due to their international policies. There are so many cheap agricultural products in the markets of the world today that if one wants to feed Canada's population cheaper, we should buy all our food from outside. In the short term it may look good but, in the long run, we are going to pay a hell of a lot because surpluses won't always be there and the population will be counting on them. It is hard for us producers to see the lack of vision of our negotiators in international trade. We have to stand up as a country and demand fair trade and not accept dumping in our markets.

Henry Garino *In another article in this issue we are dealing with how to run a cow-calf operation to maximize efficiency of production. Your operation, the feedlot, follows the cow-calf in the beef producing chain. What are your ideas on efficiency at the feedlot?*

Orance Mainville We have a phenomena in this country that dates back 15-20 years in relation to the type of animal we are feeding. We brought in at that time some exotic beef from Europe which were taller and leaner than the traditional breeds we were working with. Today they have increased the efficiency of the industry at every level and at the same time have provided a product that is the best for the consumer. Consumers want leaner meat, and that is what we are producing in Canada with these Charolais, Simmental or Limousin breeds crossed to the traditional English breeds. This is the best product and is what the slaughterhouse and the consumer want, and it has increased the efficiency in the industry.

Our feedlot is a very straightforward eastern Canadian feedlot based on the production of corn. We are corn producers and transform corn into beef. We have 900 acres of corn harvested as silage or grain and we feed 2-2,500 head per year. Our feeding program is based on corn, and we do not use by-products. We feed what crops we produce. By-products are appealing to feedlots that want to specialize in that, but we are corn producers. We buy most of our cattle in western Canada, mostly in Saskatchewan and Manitoba, mainly because of quality and available numbers. We feed calves and yearlings; it all depends on market information. This year we went with 80 per cent yearlings, and only 20 per cent calves. Last year we bought 100 per cent calves, so it all depends on what is available and on what our crystal ball tells us.

Henry Garino *You have been talking about specialists predicting and projecting. I want you to put that hat on and, as a well-known specialist in beef production, tell us what the future holds for Quebec in terms of beef production. For instance, what is going to happen if the income stabilization program ceases to be in effect?*

Orance Mainville I think the beef industry in Quebec is going to go the same way as many other industries on the continent. As a producer today we have to face one hard reality and that is the same kind of reality I faced the first year I went to college. I remember the first teacher coming in in the morning for the first course and telling us,"four years from now there is only going to be 50 per cent of you guys left." Everybody else thought the same thing: it is not going to be me, it is going to be somebody else. The reality in beef in Quebec is similar because there will be 15 per cent less cattle in North America two years from now. Perhaps the bigger, more organized feedlots will increase their capacity, but in two or three years from now one of every five people is not going to be feeding cattle. Which one is going to stay? Which one is going to go? One will have to be more careful and use every possible factor to be the most efficient because normally that is the one that does stay. Quebec's small industry is going to be hurt, I think, as much as other places mainly because it is a very low equity industry. People have high amounts of credit and when the situation gets tough that is one thing that sometimes makes the difference as to whether you stay or go. We have a very young industry in Quebec with low equity. Many feedlot operators are just learning how to produce efficiently or to feed cattle efficiently. Things are going to be tough. It will be similar to what we are going to find in the rest of Canada and the United States. Maybe 20 per cent of us are not going to be there three or four years from now.

PRIVATE FORESTRY

FOR FUN OR PROFIT?

by Professor J.D. MacArthur
Woodland Resources
Department of Renewable Resources

The privately-owned woodlands of Canada have long been the object of efforts to make them more productive. They have attracted this attention because they are, in important ways, more valuable than the public woodlands. They are more productive, more accessible, and nearer markets. Currently they produce a disproportionately large part of the annual industrial wood supply, despite the fact that they are not intensively managed. It is believed by many that more intensive management would produce a greatly increased annual harvest plus important ecological benefits, both of which would be beneficial, particularly to the rural economy.

Despite many efforts to encourage private owners to produce and market wood the general quality of management has not been significantly improved. In eastern Canada particularly there has been a sustained search for effective ways and means of encouraging private owners to grow and market wood in increasing quantity and quality, and in recent years there has been a new surge of interest in this problem. But a significant positive response remains difficult to generate.

Recently in Quebec the Ministry of Energy and Resources commissioned a wide-ranging study in an effort to come to grips with this problem and to obtain insights that would effectively guide future actions. A committee for consultation on the future of the private forest in Quebec held public hearings in 18 districts in Quebec. The final phase of the committee activities was a symposium attended by representatives from all of the regions where hearings had been held and who represented, collectively, all groups with a serious interest in the private forest. Two days of workshops were devoted to study of specific and difficult aspects of the problem.

In the workshop in which the writer took part one rather startling view was advanced by certain woodlot owners. They came equipped with financial data to support arguments that private forest production simply does not pay. This view was frequently and vociferously expressed and there was no effective rebuttal. One of the owners maintained that the only justification for operating a woodlot was that it was an interesting hobby. He argued, convincingly, that the private wood producer's costs exceed his returns and he actually loses money. This opinion was not seriously challenged by any of the workshop participants.

Owners of private woodlands are in a discouraging financial situation. They own and control forests and forest land that currently produce an important part of the industrial wood supply. This wood is needed by wood-using industries to generate profits, by governments to generate employment and revenues, and by society in order to enjoy the wealth that flows from forest production. But the private woodland owners are very often less than enthusiastic about providing this greatly desired wood. They tend to feel that their rewards are marginal or inadequate, even for purely exploitive forestry, and this feeling precludes investment in management to increase, or even to sustain, production.

Private woodland owners sell raw material to processors who reap the profits generated by the processing phase and in which the raw material supplier does not share. A comment by Gerry Burch, Vice-president in charge of forestry for British Columbia Forest Products illustrates this point (Swift 1983).

> *"We have lots of camps that lose money but we need the fibre to make money on the next stage."*

The private woodland owner corresponds to the logging camp producing raw material to be processed at a profit by the industry. Isolated, as they are, in the unrewarding logging phase the private owners are only slightly, if at all, affected by the profit motive. They end up without the desire, the incentive, or the resources to invest in forest management.

If private woodlands are, in fact, to attain their potential as a source of the industrial wood supply, the understandable inertia of the owners must be overcome. Private woodland production must be a financially attractive business, and woodland owners must be convinced that they will receive an appropriate share of the revenues generated by their efforts. They must believe that the rewards will justify the efforts. This view has been well expressed by one paragraph in a recent study in Ontario (Anon. 1983a).

> "Once the owner discovers that a market exists for his wood things will start to happen in the forest. The possibility of a reasonable stumpage return will do more to increase owner interest than an army of extension workers. The private forest will become a wealth producing enterprise and it will be possible to reduce or eliminate government subsidies."

In short, the private woodland owners will respond positively if, and only if, the benefits clearly justify the costs. If the wood is to be had, it will have to be paid for. While the problem is easy to state, the development and implementation of a solution represent a major challenge. Some old, and perhaps cherished, ideas will have to be abandoned or modified and some new approaches developed.

In the past some carefully conceived efforts to encourage production have been disappointing because they failed to take account of a key element, the owners, without whose willing cooperation there can be no success. Incentive programs may also be less than satisfactory because of

unforeseen technical factors. For example, in Quebec, and elsewhere, a great deal of public money has been, and is being, invested in reforestation. As these planted stands develop the thinnings needed to keep them healthy and productive are not done because of lack of markets for the small material that they would produce. As a result production is lost, rotations are lengthened, the investment is less rewarding than it could be, and owners are discouraged.

The views of one New Brunswick woodlot owner touch on this failing (Swift 1983):

> "I think there are too many experts. The politicians rely on the so-called forest experts — the foresters, the graduates. People like ourselves, ordinary citizens, can't question forest policy because they say right away. 'Ah, that's a technical problem!' Before you talk about technical matters you have to talk about principles and the fundamental question of control over the resource."
>
> —Euclide Chaisson, woodlot owner, Petit Rocher, N.B.

Evidence of one change in the general approach to the private forest is given in the foreword to a recently completed New Brunswick Private Woodlot Resources Study as indicated by the following quote (Anon. 1983b).

> "Several studies have dealt with the resource itself (i.e., timber) but relatively little research has focused on the social or human aspect of the sector. The Study therefore decided to put the emphasis on this latter aspect throughout its deliberations."

Since the importance of the private forest is well established, efforts will no doubt continue to maintain and enhance its value as a supplier of raw material and other benefits. In these efforts it will be important to keep the human aspect of the sector firmly in mind, as was done in the New Brunswick study. All future actions intended to encourage private forest production must be guided by a good appreciation of the situation from the viewpoint of the private owners. Only by convincing the owners that it is really profitable to produce and market wood can their enthusiastic cooperation be gained.

The process of wealth creation starts with the owners. If they do not expect to be rewarded, they will not act and there will be no process and no rewards for anyone. Good private forestry must become synonymous with good private business. Until this happens the contribution of the private forest domain to the welfare of its owners and to the local, regional, and national economies will remain well below its potential.

References

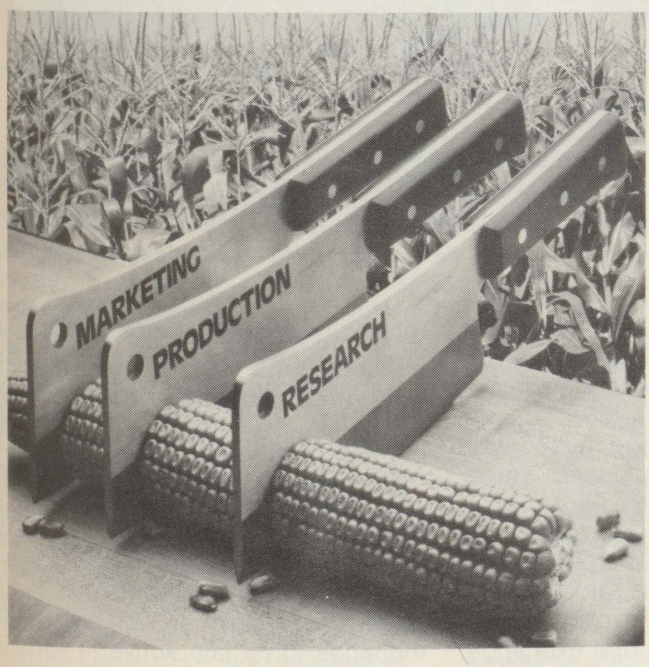
ANON 1983a. Ontario Professional Foresters Association response to — Private forest lands — a public resource. The Professional Forester, No. 97, Dec. 1983.

ANON 1983b. Private woodlots: what does the future hold? Report of the Private Woodlot Resources Study. Dept. of Natural Resources. Fredericton, N.B.

SWIFT, JAMIE. 1983. Cut and run — the assault on Canada's forests. Between the Lines. Toronto, Ont.

FUNK'S RESEARCH... OUR INVESTMENT FOR YOU

FUNK'S G HYBRID



Corn growers are seeing a new level of performance from Funk's G-Hybrids

It's the result of an extensive breeding program made possible by Funk's connection with the worldwide resources of Ciba-Geigy. The selection of inbreds from this vast genetic pool allows our Canadian corn breeders to test a tremendous volume of potential hybrids under many different stress conditions. Only the very best are then selected for use in your fields.

Thousands of hybrids enter Funk's breeding program every year, yet only one or two ever make it to market. An exhaustive selection process, with tests at every stage of breeding, ensures only the highest performing hybrids come out of Funk's breeding program. That's why it takes years to produce a single Funk hybrid, and why we're introducing new experimental hybrids every year.

All of our research dollars go into Funk's hybrids for one reason—so you get the most dollars out in harvestable yield.

FUNK SEEDS
division of CIBA-GEIGY SEEDS
CIBA-GEIGY CANADA LTD.

DIPLOMA CORNER

by Theresa Greene
BSc (Agr) '86

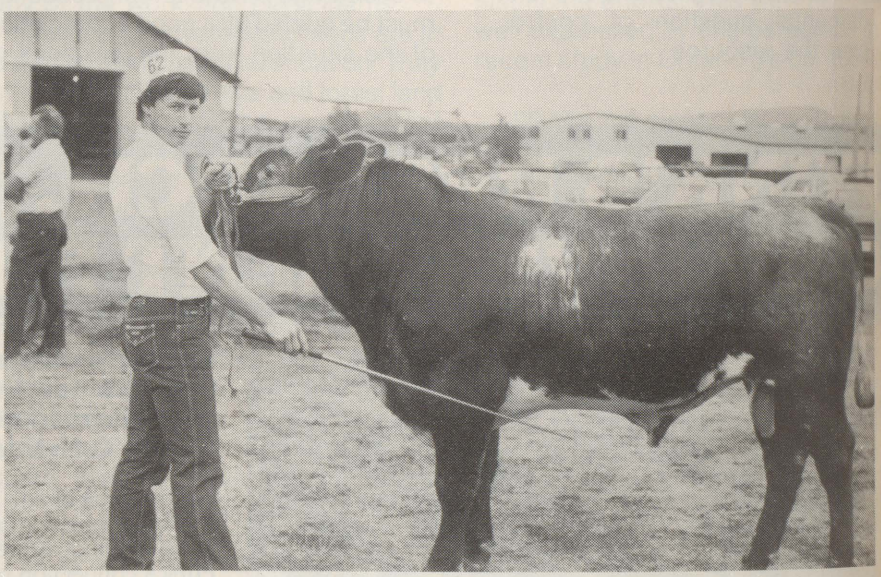
Macdonald College took to the roads again this summer to reach out and touch the public. The college visited some 21 rural fairs with a colourful display of pictures and pamphlets proving that it does, in fact, have "something for everyone." I worked at the Mac booth this summer with two of my classmates, Stephan Desjardins and Denis Berube. We were shuffling around the province with Micheline Lambert and Jean-Michel Valiquette of the Extension Services to offer us guidance and assistance.

At the fairs I met people who had never heard of the college before as well as those who had actually attended Macdonald. The presence of Macdonald went further than the 10 square feet occupied by its display. The involvement of our students, former and current alike, brought the "spirit of Mac" alive. Diploma students, in particular, showed a good turn out at the fairs. Callum McKinven, who graduated in 1980, was showing cattle for Beerwort E.T. Farm of Brome at competitions all over Quebec. People refer to him as being one of the finest herdsmen in the province. His fellow classmate David Hall was also helping the Beerworts with their cattle at the Ormstown Fair.

Another good herdsman we can be proud of is James Peel, from the Class of '82. James showed cattle for different dairy farmers all summer as part-time work. He also tests dairy herds for R.O.P. in the Lachute area.

Space will not permit mention of all the Dip and degree students and graduates I met at the various fairs either in the barns or arenas or at the booth where they took time to sign our guest book. Michel Ouimet, is a current Dip who was spending his summer doing his farm practice at the St. Chrysostome dairy farm belonging to Sylvain Parent. Both he and Sylvain, BSc (Agr) '78, took time to visit us at our booth at Ormstown. At Sherbrooke we watched with pride as a Mac family showed some of their best Ayrshires — the Burns of Island Brook. Neil is Dip '82 and his dad is Dip '49. Neil's brother Dale is working towards his degree, majoring in Plant Science and expects to graduate in '86.

At the QYF Calf Rally in Richmond Callum McKinven is about to sign the guest book at the Macdonald booth while Therese Greene looks on.



Jim Dempsey, who is now in the Dip program, showing a Shorthorn at the fair at Thetford Mines.

Macdonald College was well represented in the Quebec Young Farmers' competitions. Angus MacKinnon, Dip '84, showed a calf for the Hatley QYF Club. He is currently working in Coaticook on the family's dairy farm, but will soon be off to New Zealand on an agricultural exchange. His brother Peter has recently returned home after completing his farm practice and earning his Diploma.

Tim Keenan, a friend and former classmate of Angus's, played an important role in the QYF's tenth Annual Calf Rally that took place in mid July this year. The Richmond Club's fieldman aided in the organization of the event that his hometown played host to. Tim has got his hands full with work on the farm at home but still manages to remain active in various agricultural events.

Left to right, Stephane Desjardins, BSc '85, Monika Muller, Dip '85, Theresa Greene, and Dip Serge Breault at the Berthierville fair.

Meeting people was the part of the job I enjoyed the most. Even when I was very far from home — West Brome — I felt welcomed by the different agricultural communities because of the way people related to Macdonald. All in all, the booth was a great success and a lot of fun to be a part of. It was an opportunity to meet Paul Bertrand, Dip. '83, Andy Welden, BSc (Agr) '83, Andrew Standish, Dip '84, Kim Glover, Dip '82, current degree students Pascal Maynard, '86, Jules Boulerice, '86, and Kelley Allen, '87, and '86 Dips: Scott Kirby, Jim Dempsey, and James Duffy and many many more Mac people. Many thanks to them and to the institution's other present and former students and staff for the support they generated at the fairs, showing the "one of a kind" Mac school spirit.

The School of Dietetics and Human Nutrition

by Dr. Shirley M. Weber
Acting Director
School of Dietetics and Human Nutrition

On June 1, 1985, the School of Dietetics and Human Nutrition was introduced as an academic unit at Macdonald College of McGill University. The School will house the majority of the academic majors in the former School of Food Science, but the new name reflects the presence of its principal major, the professional program in dietetics.

The academic majors in the School of Dietetics and Human Nutrition include:

1. Dietetics
2. Nutrition
3. Food and Consumer Services

The **Dietetics** major is unique among anglophone universities in Canada in that an internship is integrated with the academic program. Thus, when students complete the Bachelor's program in Dietetics, they have both the academic and internship prerequisites necessary to enter the profession. This program has been in effect at McGill since 1978 and there has been a steady increase in the number of students choosing the major to the point that it is now the largest academic major at Macdonald College. The dietetics major has been offered at McGill since 1918, and internships were offered by the Royal Victoria Hospital and the Montreal General Hospital shortly thereafter. Today, these two hospitals along with several other health care centres and food service operations participate in the internship, or as it is now called Professional Practice phase of the student's education.

The **Nutrition** major was introduced in the curricula in 1972 and since that time has consistently attracted a small group of students. These students have been interested in preparation for graduate studies or medical school as well as positions in research laboratories. Students in this major take the courses in human nutrition required in the dietetics program but do not take those in food administration. The emphasis on human nutrition in the School of Dietetics and Human Nutrition differentiates it from the courses in animal nutrition offered in the Department of Animal Science.

The **Food and Consumer Services** major provides a background for students who plan to work directly with consumers, either in consumer affairs or food-related positions. Students specialize in either 1) consumer services, 2) food services, or 3) family resource management. This major, which was formed from the original Consumer Services and Food Administration program, will be offered for the first time by the School in the fall of 1985.

As well as offering these programs, the School will, as in the past, participate in the B.Ed. degree majoring in home economics. Students in home economics will now spend their first year at Macdonald College to take courses in foods, nutrition, textiles, and consumer studies and complete their second and third years at the downtown campus.

School's Staff

Full-time and part-time staff in the School of Dietetics and Human Nutrition include faculty members associated with dietetics and consumer science including: Lanita Carter, Linda Currie, Elizabeth Jennaway-Eaman, Mary Mackey, Diane Raymond, Marilyn Rigelhof, Marion Zarkadas, and Shirley M. Weber as Acting Director, as well as the Clinical Co-ordinators: Beth Armour, Kristina Klicius, Susan Morgan, Mariette Samuel, and Stephanie Smith. The new School occupies the area formerly housing the School of Food Science in the Macdonald Stewart Building as well as Harrison House on the Macdonald College campus.

The Food Science major, formerly in the School of Food Science, has now amalgamated with the Department of Agricultural Chemistry and Physics. Staff members James Smith and Fred van de Voort are now associated with the Food Science and Food Chemistry majors in the new Department of Food Science and Agricultural Chemistry.

FUN FACT FABLE FICTION

by Ralph H. Estey
Emeritus Professor
Department of Plant Science

Bowing to popular demand (two verbal requests and dozens of letters that didn't get written), more nonsense verses and limericks, some of which I composed (guess which?) are included this month.

Would we be here if
Adam had kept
His hands on his ribs
whenever he slept?
Or would God have just
used a bit more clay
And made the first
woman in the old
fashioned way?

When Adam saw Eve
in her brand new gown
He forced a broad smile
to hide his first frown
Then whispered to her
in her unadorned ear
"You have the prettiest
dress of anyone here."
Now that was a mistake
as all men now know
Eve wanted new gowns
faster than fig leaves
can grow.

A wanton yound lady
of Wimbley
Reproached for not
acting more primly
Answered,
"Heavens above
I know sex isn't love
But it's such an attractive
fascimile."

A bather whose clothing
was strewed
By breezes that left
her quite nude
Saw a man coming along
And, unless I am wrong
You expected this line
to be lewd.

What's Your Colour?
When a man is rebellious he is said to be *red,* when loyal *true blue,* when afraid *yellow,* when "straight" *white,* when inexperienced *green,* when vivaciously healthy *in the pink,* when saddened *blue,* when uninteresting *colourless.* Personally, I am in a *grey* zone most of the time. What is your colour?

One is Enough
The strongest Biblical argument against polygamy is found in Matthew 6:24. "No man can serve two masters . . ."

Christmas birds
Many people buy one or more chickens or other birds in preparation for a Christmas feast. Did you know that Christ made an indirect reference to the economic advantage of quantity buying? In Matthew (10:29) He refers to two sparrows being sold for a farthing, and in Luke (12.6) He mentions five sparrows for two farthings. In other words, buy four birds at the regular price and get one free.

Take care
Helen: What kind of a husband should I try to get?
Grandma: You just leave husbands alone and get yourself an unmarried man.

Canada's first bank
John Richardson, together with a group of Montreal merchants, organized Canada's first bank. The Bank of Montreal opened for business on November 3, 1817.

Lost colony
In 1585 a group of 108 men sailed from England and, under the auspices of Sir Walter Raleigh, settled on Roanoke Island off the coast of what is now North Carolina. Within a year they sailed back to England on ships owned by Sir Francis Drake. More colonists and supplies arrived from England a few days after the first group left but of these only 15 men chose to stay on the island. On July 22, 1589, a third group of settlers, men and women, led by John White, reached the island and found it deserted. Not one of the 15 men who had remained the year before could be found, dead or alive.

On August 18, John White's daughter gave birth to a baby girl. Shortly after, White and his ships went back to England for supplies and more settlers but because of war with Spain they were detained until 1590. When White returned with high hopes of seeing his daughter and grandchild again, he could find no trace of any of the 117 he had left on Roanoke Island, except for the word "Croatoan" carved on a tree.

The fate of the 15 men of the second group of colonists and that of the 117 in the third group remains a mystery. Indians who call themselves Croatans live among the hills of North Carolina. Although many of these Croatans have English names there is no proven connection between them and the lost colonists of Roanoke Island.

Christmas fables
As the Christmas season approaches we will soon be hearing songs and seeing cards that feature the "three wise men from the east," the "three kings," or "the magi." None of these have very solid foundations in the Bible. Saint Matthew (Chapter 2) provides the most complete story in this regard and although he refers to "wise men from the east," he doesn't tell us how many were involved and he didn't refer to them as kings or magicians. There may well have been only two, and if they came from the east any bright star over Bethlehem would have been to their west, and they could not have followed "a star in the east."

King Herod ordered the slaughter of all babies up to two years of age. This suggests that Christ was between one and two years old when Herod sent the wise men out to find the young child. Incidentally, they found Mary and the child in a house, not in a stable (Matthew 2:11). Thus, all the Christmastime stable scenes that include three wise men and their gifts have no biblical basis.

Are brand names meaningful?
The Matsushita Electric Co. of Japan has manufactured products that bear such well-known brand names in Canada as: Panasonic, Sylvania, RCA, Magnavox, General Electric, Quasar, Philips, Philco, Electrohome, and probably others. So what's in a name these days?

The Nutritionist in Today's Society

by Professor Eugene Donefer
Department of Animal Science

This article is based on the E.W. Crampton Nutrition Lecture given by Dr. E. Donefer in November, 1982, when he was presented with the E.W. Crampton Award for Distinguished Service to Nutrition. The original presentation has been condensed and updated for the purpose of this article.

I would like to use this occasion to commemorate the unique and outstanding characteristics of Dr. Crampton's contribution to the science of nutrition — which resulted in his international recognition and that of the Department of Nutrition at Macdonald College, which he headed for the 20-year period of its existence. He demonstrated that the most important component of research was the development of ideas, and his originality of thought was applied in many seemingly divergent areas of nutrition. His contributions to knowledge thus varied from the nutrition of humans to that of laboratory animals, of swine and of ruminants. In human nutrition, his studies ranged from early work in developing a bio-assay for Vitamin C to his post-retirement work with the Montreal Diet Dispensary in developing tables of nutrient requirements for pregnant women. His pioneering work with swine included determining the effect of diet on body composition, and the first testing of computer formulated rations in feeding trials with weanling pigs. His outstanding contributions to ruminant nutrition included demonstration of the effect of lignification in forage digestibility to the initial identification of the importance of the voluntary intake of forages as a criterion of nutritive value. Dr. Crampton died in 1983 in his 88th year and his unique contribution to the science of nutrition during the 51-year period he was at Macdonald College has been documented in a biographical sketch written by Dr. L.E. Lloyd which appeared in the 1985 issue of the *Journal of Nutrition*. (Copies of this biography can be obtained by request from Hazel M. Clarke, Editor, Macdonald Journal).

Although the announcement indicates that I have been presented the Crampton Award for work in the area of ruminant nutrition, my intent is not to make this the subject of my presentation but rather, in the spirit of Dr. Crampton's lessons in diversity, to discuss the role of the nutritionist in today's society — with particular reference to human nutritional status. As I find many aspects of the present situation disturbing, I may attempt to pass this disturbance on to you. Although I am indicating my opinions and interpretations, I will attempt to be objective in their presentation and hope you might consider them in that spirit for your own consideration and judgement.

Status of Nutritional Knowledge

The relatively new science of nutrition was born out of the pioneering studies in the last century of energy and protein metabolism and saw its real beginnings in the dawn of this century with the discovery of the vitamins and essential minerals and their role in sustaining animal life, discoveries which are still unfolding.

It is thus possible for present day students of nutrition to learn the occurrence, utilization, and interactions of a long list of essential nutrients as contained in the food components we consume for our sustenance. As a result of this newly gained knowledge, nutritional disorders, which have plagued man for centuries, have been identified as to their causative factors and, in many instances, no longer constitute the endemic menace that once existed.

The first disturbing matter is the fact that large portions of the world's human population are still affected by nutritional diseases. At the present time nutritional disorders such as rickets, xerophthalmia, goitre, pellagra and protein-energy malnutrition (to name the most prevalent) occur particularly among the young and primarily due to the poverty of many of the world's people, both in developing and developed countries. This is thus no longer a question of nutritional science but one of economics and politics, implying that the disappearance of malnutrition will be based on solutions which will result in a more equitable distribution of available food resources.

Status of Nutritional Practice

The primary emphasis of this article is on the nutritional situation existing in this country and on this continent and what I believe to be an increasing trend towards deterioration of the quality of our food supply. This negative situation is a result of actions taken by at least part of our food processing and distribution industry and is apparently sanctioned by established professional agriculturists and nutritionists, as evidenced by their lack of any real protest and, in many cases, with their active or passive support.

In past years when individuals or groups have spoken out against the use of food additives, we have tended to dismiss their views as alarmist and have suggested that many of the so called "chemicals" being questioned were actually the legitimate chemical terminology for vitamins and other naturally occurring substances. I would now have no difficulty in supporting the position that many of the additives to our food supply are of negative nutritive value, that it is difficult to justify the necessity of their presence, and that they are alarming in terms of the levels used. Two of the most commonly overused food additives are sugar and salt.

The mandatory labelling of many food products has enabled us to more easily identify the presence of added substances and also gives some indication of the relative amount present as related to the order in which they are listed. It is assumed that only a small section of the consuming public are label readers, and, in many cases, may not have the technical background to interpret what is presented. In many so-called fabricated foods there has been an increasing tendency to have salt and sugar as the major components, although in the latter case this is disguised by the many substances which are sources of sugars, such as glucose, cane and corn syrups and solids, with invert, dextrose, fructose, and other terms being used, and in many cases several of these appear in the same food.

What has been happening to the North American institution of the cold breakfast cereal from its introduction at the beginning of this century as a

helpful addition to our diet (due to its use of whole grains and then by-products) to the present situation? Two frightening trends are easily observable, one being the remarkable increase in sugar content, with many of the original brands containing less than 10 per cent total sugar, but with many of the present day offerings containing sugar levels of 40-50 per cent. Equally disquieting is the sales pitch of high sugar breakfast products to the most vulnerable section of our population — young children — as illustrated by product names, box design, and advertising strategy.

A new and alarming occurrence of recent years has been the increasing appearance of fabricated foods, which can also be termed as artificial or synthetic foods. Foods with names and characteristics of common foods are now appearing in which the original identifiable food may not even be present; instead we have a list of ingredients which predominate in sugars and salt laced with artificial colours and flavours. Many of these products are sold directly to food processors for incorporation into other food products so that their presence may be unknown to the public which does not read the trade papers. An example is the commercial availability of "synthetic tomato paste" which is sold for incorporation into juices, soups, sauces, and pizza mixes. This material is advertised (in trade papers) to be able to substitute for up to one-half of the natural ingredient at one-tenth the price and contains about 50 per cent sugar with synthetic colour and flavour.

Another available item for food manufacturing use is "imitation honey," which, since it contains some real honey, can be so designated on the food label. Artificial chocolate is also now available in a chemical form as are "replacements" for many other traditional foods. Why are these products used? The major motivation appears to be the reduction of the cost of food processing and, since there is no indication that these savings are passed on to the consumer, the effect is to maximize profits while reducing quality. It may be of interest to project what effect the increasing use of artificial foods will have on the primary producer of the higher priced, but real foods — the farmer.

Many of the fabricated food products are sold directly to the consumer, who may very well be unaware of the actual nature of his purchase due to the suggestive and sometimes deceptive marketing strategies employed. United States government regulatory agencies have caused the discontinuation of foods such as "Orange Twist Frozen Refreshment Drink" which contained no oranges, and "Sun-Apple Fruit Drink" which contained no apples. A leading manufacturer still sells "Applesauce Spice Cake Mix" which, of course, contains no applesauce or apple product. Legally correct, but morally questionable, it becomes a case of which noun the adjective is modifying. Apple or orange drinks commonly sold can contain less than 10 per cent of the named and pictured main ingredient since the term drink and not juice is used. How many of these subtle substitutions will we be able to identify?

The traditional use of sugar in limited quantities as a sweetener would appear to be superceded by its alarmingly increased use as an inexpensive food extender and "flavour enhancer," and it is being added to foods in as large a quantity as possible. Although we should recognize that some dessert food and confectionary products are predominately sugar, and thus attempt to take measures to control their intake, we may be totally unaware of the presence of sugar in other supposedly non-sweet food products. A coffee "whitener" product replacing traditional dairy products consists of 65 per cent sugar. A bazarre outcome of the presence of such a substitute food in the market place is the report in a U.S. medical journal of a child developing Kwashiorkor (the protein-energy malnutrition disease found in Africa) after being fed "non-dairy creamer" instead of milk. The effect of increasing the sugar content in our foods can only be regarded as a potential nutritional disaster. North American per capita sugar intakes of 150 g daily, amounts to 60 kg (132 lb) annually and results in over 20-25 per cent of our total energy intake being derived from sugars. As no other nutrients are contained in sugar, its excessive intake shifts the need for a higher nutrient density in remaining foods consumed, encourages the "shot-gun" approach in adding vitamin and mineral supplements, or more likely sets the stage for multiple nutritional deficiencies.

Misused (abused) Terminology

The term "junk food" has come into increasing use to describe those foods making a limited or even negative contribution to the diet, but due to the over-enthusiasm of some, confusion has arisen as to what constitutes a junk food. As a separate development the remarkable success of "fast food" outlets has been due to the convenience, consistency, and economy they offer although not generally in gastronomic terms. It is inaccurate to suggest that fast foods are synonymous with junk foods, as the former can represent an important source of nutrient supply to an increasing proportion of our population. Meals with hamburgers, chicken, fish, and even pizza, can supply from 40 to 80 per cent of the daily protein requirement, and at a reasonable price. A nutritional problem relating to fast food outlets which sell products containing high-quality protein is that other items they offer are often junk foods, such as french fried potatoes with an increase in the fat content of the potato from 0 to 13 per cent, and the infamous carbonated soft drinks (which are flavoured nine per cent sugar solutions). Another potential problem is that good nutritive contribution of a food such as pizza (due to the balance of ingredients used in its preparation: flour, tomatoes, cheese, meat) may be seriously eroded by the financial temptation of introducing ingredients such as synthetic tomato paste and artificial cheese (a problem already existing). An additional problem is the unnecessarily high sodium (Na) content of most "fast foods."

Misleading Nutritive Values

The positive nutritional contribution of the animal industry through fast food outlets is partially counteracted by some animal by-product foods such as hot dogs and bologna which are particularly popular with the young and with low-income families and should represent an inexpensive source of good quality protein. Their actual protein content of 12 per cent is half of what is found in lean-meat products, and their cost per unit protein is similar to steak and greatly exceeds alter-

ıative protein foods such as poultry ınd fish. An average fat content of 28 ıer cent and water content of 55 per ;ent is the result of regulations which ıllow fat and water addition so that ;uch a product ends up being a mis-eading and poor representative of the ivestock industry. This has not ırevented recent advertisements in J.S. medical journals by the National .ivestock and Meat Board stating that ırocessed meats are "nutritious" since hot dogs contain 12 per cent protein. What is omitted is that the hot dog bun may contain almost as much protein (although of lower quality) and that the sodium content of over 500 mg is over three times the daily requirement.

Do We Need Caffeine?

Another case I would like to present in respect to the "consumer rip-off syndrome" is caffeine in beverages. The natural occurrence of this mild stimulant in coffee and tea is in part responsible for the traditional and widespread adoption and perhaps addiction to these drinks. A limited consumer preference for decaffeinated coffee in North America has resulted in recent years in the removal of over two million pounds per year of caffeine from coffee beans.

It is also generally recognized that the kola-nut extract used in the preparation of that famous beverage is a natural source of caffeine, which was confirmed in an article in the *Canadian Consumer* (February, 1980), in which 15 cola drinks sold in Canada were analyzed and caffeine contents of from 4-27 mg per can were found (indicating a wide variation of caffeine content, even among cola drinks). What dramatically changed public awareness of the caffeine story — was an article in the U.S. *Consumer Reports* (October, 1981) in which 24 soft drinks (both cola and non-cola) were analyzed for caffeine. Surprisingly, the highest caffeine contents were found in the **non**-cola sodas with contents up to 50 mg/can in diet and orange flavoured drinks. The revelation was then made to the lay public that 95 per cent of the caffeine in cola and 100 per cent in other flavours **were added** and originated as a by-product of decaffeinated coffee manufacture. The industry commented that caffeine was used as a flavour enhancer, with the inference that the much advertised "lift" is due to the stimulatory effect of the added caffeine. After this practice became public information, the current situation has developed where companies selling carbonated drinks are profiting from public confusion by selling a variety of products with and without caffeine. What should be of more concern to the public is that an unnecessary and potentially harmful food additive was introduced into their food supply, with a particular target group being children who, in many cases, are receiving higher doses of caffeine than their coffee-drinking parents.

The average per capita North America consumption of coffee and sweetened carbonated drinks exceeds 200 litres per year, which far exceeds the intake of other beverages such as milk and fruit juices. There is no nutritional or economic reason for this choice of beverage because the cost per serving of the "healthy drinks" is

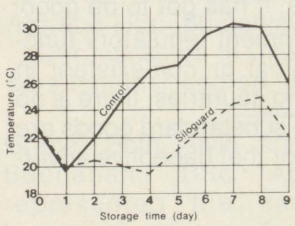
SILO® GUARD

For over 20 years profitable livestock producers have relied upon "SILO GUARD" for treatment of all types of silage. Now recent controlled research at McDonald College, Dept. of Agricultural Chemistry and Physics has proven "SILO GUARD" to be effective on high moisture hay as well.
"SILO GUARD" is easy to apply through the use of a Gandy Applicator to either round or square bales resulting in a better quality hay.
Through a unique patented process "SILO GUARD" helps reduce heating and mustiness in baled hay. (max. 25% moisture). This means you can bale sooner without worrying about losing valuable leaves and small stems.
"SILO GUARD" a safe, reliable, non corrosive food grade product is one of the many ISF products available. Consult your rep for further details. Trust ISF, Quality products for over 80 years.

Effect of SILO GUARD on the weight loss and dry matter loss of baled hay!

Treatment	Weight Loss (%) (average 5 bales)	Dry Matter Loss (average 5 bales)
Control	22.7	13.6%
Silo Guard	16.0	6.6%

Results of research conducted at McDonald College on hay baled at 22.5% moisture. Dry matter loss was reduced by over 50% and weight loss by 30%.



Effect of Siloguard on the temperature of baled hay.

THE MARK OF QUALITY PRODUCTS®
ISF
INTERNATIONAL STOCK FOOD CO. LTD.
P.O. BOX 1024, CAMBRIDGE, ONT.
N1R 5Y2 (519) 622-2730

actually less in many cases than the poor nutritional alternatives. Milk, apple juice, and orange juice range in price from 20-30 cents per 250 ml serving which is similar to the price of the bottled carbonated "soft" drinks. Canned soft drinks can cost up to double the cost of the same serving size of milk or juice. The North American beverage intake pattern is not nutritionally justified and in part represents a failure in our nutrition education programs. I would ask each of you to think of our institutionalized "coffee breaks" and "coffee rooms" and inquire as to the provision of alternative beverages (juices and milk) at campus and professional functions.

Whose Responsibility?

If I have at least partially convinced you that there is a serious problem in regard to the deteriorating nutritive quality of our food supply (time has only permitted a few of many examples), what is our responsibility as agriculturists, food scientists, and nutritionists, both as individuals and through our professional organizations? Do we not expect the agricultural, dietetic, and nutritional associations to at least objectively review the situation and through their various professional publications to sound the alarm if necessary? I would like to suggest that these associations are unduly influenced, either consciously or unconsciously, by the very components of the food industry which are responsible for the nutritional abuse. The "Sustaining Associates" of the American Institute of Nutrition, includes many companies responsible for products of questionable nutritional value. These companies are also well represented in the Nutrition Foundation Inc. (publishers of Nutrition Reviews), with its combination of public and industry trustees and with its stated dedication to "improve the health and welfare of mankind." The most consistent source of information relating to food quality appears in the various consumer orientated magazines such as *Consumer Reports* (US), the *Canadian Consumer*, and an outstanding publication of the Quebec Government Office of Consumer Protection entitled *"Protect Yourself."* The Ontario Public Interest Group, with branches seen on seven university campuses has been responsible for publications like *"The Supermarket Tour,"* and the Ontario Arts Council has provided financial support for the publication of *"The Land of Milk and Money"* which is the National Report of the People's Food Commission and is an attempt to collect a broad range of submissions from organizations and individuals across Canada relating to our food supply. As the above organizations and publications appear to be more sensitive to the nutritional needs of consumers, they should receive more active support by agriculturists, food scientists, and nutritionists.

International Implications

What effect do "developments" in North American food technology have on other countries, particularly those of the third world. In one word the effect is "disastrous," for a variety of reasons. In taking a tour of a supermarket in the Caribbean one has to be impressed by the varied and international origin of the packaged goods displayed. The same North American products of questionable nutritive value have been shipped to other countries. It is somewhat of a shock to see sugar-frosted cereals, puffs and chips of various shapes and flavours, which have been purchased with valuable foreign exchange resources, being offered at more than premium prices to the local population, who tend to assume that since it comes from North America, it has got to be good.

Since government regulatory functions are minimal or non-existent in most developing countries, there is no guarantee that substandard goods are not being sold or that deceptive advertising is not being used. For many products the third world has become the dumping ground for substandard and unsafe materials from elsewhere.

The Ultimate Concern

As I have attempted to cover a multitude of topics of nutritional concern in this article, I will present one further question which may be the most important issue of all — and that is the negative effect of world-wide military expenditures on human development. Of course it could be suggested that the collective overkill of the superpowers would solve all problems of nutrition and, of course, life itself. Taking a more optimistic point of view that life will not end in that fashion, it is inconceivable that both the overdeveloped and less developed nations can carry out any programs to benefit the health and welfare of their populations while still spending a disproportionate amount of their resources for military purposes.

Let me cite the following quotation

> "Every gun that is made, every warship launched, every rocked fired, signifies, in a final sense, a theft from those who hunger and are not fed, from those who are cold and are not clothed."

Assuming an old soldier knows best, this is a statement made by Dwight D. Eisenhower (U.S. General and President).

Quoting statistics on military spending can be abstract in that the quantities of funds involved are difficult to comprehend; for instance, in 1983 the global military expenditure (all countries) reached $660 billion US dollars, which works out to about 1.2 million dollars a minute. A recent United Nations publication attempted to relate military expenditures to specific examples in terms of "nuclear submarine units," with one unit (or sub) valued at $1.7 billion (and estimates that approximately 300 such subs had been built by 1980). The number of "submarine unit" equivalents are stated for the following items:

	"Submarine Units"
Total Asian rice import ('77)	1.1
Aid to Latin America ('77)	1.0
World Bank loans to Agriculture ('78)	0.9
FAO accumulated budget from 1945-1980 (35 years)	0.6
International agricultural research from 1960-80 (20 years)	0.4

Which are the priorities that society will adopt: destruction or development? Limited world resources can afford only one of these alternatives.

I will end with a plea that as professionals involved in the food sciences, or as members of the human society, we all have a moral responsibility for its preservation and advancement which can only be achieved if we take an active interest and play an active role to help influence change.

MACDONALD: FLYING THE FLAG

Resplendent with green and gold flags and banners — the colours of fall and Macdonald College — the Centennial Centre was a hive of activity early on Saturday morning, September 28th. Graduates representing 21 different years (between 1922 and 1981) and as many distant locations, returned to Macdonald to take part in one or more of the day's activities, whether it was the Reunion '85 program, a Woodsmen Meet in honour of their 25th anniversary, or the Diploma Convocation.

Team spirit was also evident in the large number of Macdonald staff who gave their time, energy, and expertise to offer graduates a wide choice of activities throughout the day.

Dr. Shirley Weber gave an informative seminar on the evolution of the School of Dietetics and Human Nutrition. With the recent revival of interest in nutrition, she illustrated how faculty staff had helped stimulate a broader awareness of and interest in the problems of native peoples and Third World countries.

Dr. Garth Coffin, assisted by staff members, gave a seminar on the recent changes to the Agricultural Economics program and discussed how they related to the changes in Canadian agriculture.

Many graduates took advantage of the scheduled visits to the Brace Research Centre, Food Processing Pilot Plant, and the Raptor Research Centre, arranged courtesy of Dr. T.A. Lawand, Dr. F.R. van de Voort and André Lavigne respectively.

Graduates also got an idea of the layout of the new farm complex from an exhibit in the Centennial Centre which was set up by Rudi Dallenbach, Farm Director.

REUNION LUNCHEON

The main event at Reunion '85 that brought graduates together spanning 60 years of Macdonald tradition was a buffet lunch in the ballroom of the Centennial Centre. Under the Chairmanship of Grant Ross, President of the Macdonald Branch of the McGill Graduates' Society, the lunch began with the graduate coming the furthest distance, Alvin Bennett, BSc Agr'60, from Jamaica, being called upon to say Grace. Both Alvin and J. Stewart Buchanan, BSc Agr'22, who represented the earliest class registered at this year's reunion, were presented with the new Macdonald tie.

Just before lunch was served, the 25th and 50th Reunion classes of '60 and '35 respectively were presented with their pins. Bob Flood, BSc Agr'35, led the parade of 15 from his class who were congratulated personally by Dean Buckland. Dr. Eric Beauchamp, BSc Agr'60, accepted the pins for his class who only have until 2010 to reach the distinguished status of the Class of '35. Subsequently, Grant Ross proposed a toast to both classes to the cheer of some 170 others at lunch.

As dessert and coffee were being served, the Gold Key Awards were presented by the Dean to Marc Vezina, BSc Agr'86, David Shutler, BSc Agr'84, and Velma Sutherland, BSc FSc'85, who was in Europe at the time. The Gold Key Award is presented by the Macdonald Branch to deserving students in recognition of their outstanding contribution to campus life through extra-curricular activities at Macdonald. Candidates are nominated by their peers and interviewed by a selection committee of the branch who may award any number of students.

Next on the agenda was the presentation of the Honour Shield for the Reunion class with the best registered class participation. Out of a possible 11 classes, this hotly contested award was accepted by Bob Flood on behalf of his Class of '35. Presenting the

Although the competition was keen between the Class of '35 and the Class of '60, it was a gracious and smiling Jean McHarg, BSc (H Ec) '60 who presented the Honour Shield to Bob Flood.

MACDONALD HONOUR SHIELD

Few people could have predicted the results of the Honour Shield competition which is awarded to the class with the highest percentage of graduate participation. With an outstanding 61.5 per cent of graduates in attendance, the Class of 35 won the day.

Participation from all Reunion classes was competitive. The Diploma Class of '60 came a close second with 50 per cent in attendance and the favourites Agr and HEc '60 achieved the third highest attendance figures.

Our thanks go to Class Chairmen for their work in keeping the class members together and bringing them back for reunion.

Shield was Jean McHarg, Bsc(HEc)'60, Chairman of her class and the entire Reunion '85 program. Needless to say, there were charges of favouritism from the Class of '60 who had a larger number but lost on the critical factor of percentage. Not to be completely outdone, the Class of '60 formed a chorus line and sang a mature rendition of their class song performed at their last Skit Nite some two and a half decades ago. The absence of former sweet dulcet tones of yesteryear was compensated by the vigour and enthusiasm of their numbers.

At this point of a busy program, Tom Thompson, BSc(PE)'58, Dip'60, M.Ed'78, a Director of the Branch and long-time worker for Macdonald on the McGill Development Office staff, presented an engraved tray and a new tie to Dr. Lewis Lloyd on behalf of the branch in recognition of Dr. "Lew's" many years of excellent service to the College. Lew's record as a teacher, researcher, first chairman of the Animal Science Department and, lastly, as Dean and Vice-Principal is outstanding, as has been his contribution to branch activities.

The program then focused on the Mastery for Service Award presented to Professor Helen Neilson for her outstanding service to the college, the university, and the wider community served by them. During a half century of association with Macdonald beginning as a student, Professor Neilson was a professor, Director of the Schools of Household Science and Food Science, and the first woman to represent the faculty on the University

Alvin Bennett, BSc (Agr) '60 from Jamaica, r, was invited to say grace by Macdonald Branch President Grant Ross.

BHS '35 graduates were brought together by Mrs. Marjorie Finlayson, seen here being presented with her pin by Dean Buckland.

Judy Elliott leads the Class of '60 in a spirited rendition of their class song sung some 25 years ago.

Senate. In 1980, Professor Neilson was appointed an Emeritus Professor. Today Helen Neilson is working with typical diligence on the second period of the history of Macdonald, 1955 to the present. Only the second person to ever receive the Mastery for Service award, Professor Neilson's name adorns the plaque along with Dr. Rowles who won it five years ago.

Finally, with the program complete, Grant Ross closed off the lunch by congratulating the Class of '80 who raised $500 to buy two solar cookers from the Brace Research Institute to ship to Ethiopia. "This charitable act," Grant Ross concluded, "demonstrates a clear understanding of our motto 'Mastery for Service' which I have always known to mean 'To understand freely is to serve completely.' "

Class of '35 and Drs. Laura and Bill Rowles, l to r, Guy Shewell, Desmond Beall, Bob Flood, Amelia (Morrison) Beall, Albert E. McCollom, Laura Rowles, Thomas Chiasson, Bill Rowles, and Ranulph Hudston.

NOSTALGIA '35

Through the initial stimulus of the Graduate Society and Susan Reid in particular, the process of getting in touch with and obtaining a response from classmates worked like a charm. The initial response from the Maritimes and Ontario was so enthusiastic that making arrangements became a pleasure.

Quite a number of the Class of '35 had not seen the campus for many years but had read or heard of changes: the transfer of Teachers to Montreal, turning the main buildings over to a CEGEP, etc. Real apprehension existed in many of our minds concerning the campus itself. Class of '35 and wives took the bus trip for the Campus Tour and sighs of relief prevailed as one after another recognized well known spots and enjoyed seeing new facilities.

Thanks to Mrs. McHarg, H.Ec. '60. and her helpers throughout the college the Saturday program was well planned and no one could have run out of places to see and things to do.

Mrs. Muriel Moisan recommended ideal accommodation in Dorion for the Class of '35 and here we all assembled between noon and 7 p,m, on Friday September 27th in time to have a first class dinner at a Chinese restaurant. Both at dinner and breakfast the following morning none of us could stop talking except for the odd mouthful of food!

The highlight of the day where all classes joined in was the Macdonald Reunion Luncheon where we were able to have our tables beside BHS '35 who had been brought together by Marg Finlayson. Our greatest thrill was having Dr. William Rowles, our honorary chairman, and his delightful wife Dr. Laura at our table.

The Mastery for Service Award was presented to Emeritus Professor Helen R. Neilson by Dean Buckland. A BHS '39 graduate, Professor Neilson was Director of the School of Food Science before she retired in 1980.

Our big success was winning the Class Shield for the best percentage attendance; this was achieved almost at the last minute by the arrival of Amelia (Morrison) Beale and her husband. As they had changed their address, news of Reunion only reached the Beales in North Carolina a few days before. But they came!

The large number of 25-year graduates and larger gathering of much younger graduates made a wonderful day for all of us. Thanks to the scores of Mac staff, of every description, and students and alumni for a remarkable day.

Robert Flood,
Waterloo, Que.

newsmakers

NEWS FROM SWITZERLAND

Greetings from Switzerland! As you may or may not have heard I now live in Zurich — for three years. When I resigned as Faculty Lecturer from Mac (December 1982), I went to work for the Director of the Food Research Institute, Agriculture Canada, Ottawa, on food industry contract management. As of April 1, 1985, I transferred to the Quebec Region, St. Hyacinthe Food Research Centre, Agriculture Canada. Since it is still being built I was approved for educational leave for PhD training. I am to specialize in fruits and vegetables.

We selected the Swiss Federal Institute of Technology as a European centre of expertise. So here I am, working on Apple Texture — Instrumental and Sensory Measurement. I am also learning German, although the majority of my work is in English.

The Journal is looking better all the time. I hope the summer has gone well for everyone. I hope to return to Montreal for a visit and conference next spring and will try to make it out to Mac.

Karen Lapsley
BSc (F. Sc) '74

FRED PROUDFOOT, BSc (Agr) '43, has stepped down as Head of the Poultry Section at Kentville Research Station in anticipation of his retirement later this year. Fred was born and brought up on a poultry and dairy farm in Salt Springs, near New Glasgow, N.S. He is a graduate of NSAC, of Macdonald, and he obtained a Master's degree in poultry science and economics from Cornell University. He began his career as a poultry scientist at a time of great change when the poultry industry was becoming commercialized. His influence on the industry has been immense. For eight years he was Head of the Poultry Science Department at NSAC and was also in charge of poultry extension for the provincial department of agriculture before joining the staff at Kentville in 1955. In his 30 years at the station, Fred made many outstanding contributions to poultry research and achieved international recognition.

Fred Proudfoot's successor is **BUD HULAN,** BSc (Agr) '65, MSc (Agr) '68. Bud is a native of Jeffery's, Newfoundland. He obtained his PhD in nutritional biochemistry from the University of Maine. He joined the Research Branch in St. John's, subsequently spent five years at the Animal Research Centre in Ottawa, then joined Kentville in 1977. He, too, has made his mark as an outstanding poultry scientist at Kentville.

Fred Proudfoot notes that in the 1950s it took 84 days to produce a 1.6 kg broiler chicken; with today's technology, this weight can be achieved in 42 days. Looking to the future Bud Hulan says, "In five years we will be able to produce a 1.6 kg broiler in 32 days. The chicken industry is asking for a leaner chicken, but it will not be as flavourful, juicy, and tender a bird because it is the fat that gives chicken most of its flavour. With the increased interest in the nutritional properties of foods, Bud Hulan is now working to improve the nutritional value of poultry. (Excerpts from Agriculture Canada Research Branch *Tableau,* August 1985)

GABRIEL V. COMEAU, BSc (Agr) '75, has been named Supervisor of the N.S. Department of Agriculture and Marketing's Farm Management Division in Truro. He has worked as Assistant Agricultural Representative for Halifax County and East Hants areas, and in 1978 he was appointed Agricultural Representative for Annapolis County. In 1984 Gabriel attended Cornell University receiving a Masters degree in Agricultural Economics.

WELDON SMITH, BSc (Agr) '75, has been appointed to the position of 4-H Representative for Central Nova Scotia by the N.S. Department of Agriculture and Marketing. In 1975 he was appointed as the 4-H Representative for Annapolis, Digby, and Yarmouth Counties, and in 1979 he assumed the position of 4-H Representative for the South Shore region of Lunenburg, Queens, and Shelburne Counties.

BRIAN ENGLISH, BSc (Agr Eng) '79, after stints with Environment Ontario and the Kemptville College of Agricultural Technology, is now an Extension Engineer with the Manitoba Department of Agriculture, aiding farmers in the region north of Winnipeg.

CLAUDE WEIL, BSc (Agr Eng) '81, MSc '83 is the Head of Agricultural Engineering Services, Alfred College of Agricultural Technology, Alfred, Ontario. He was joined last year by **YVES CHOINIÈRE,** BSc (Agr Eng) '84.

CHRIS STRATFORD, BSc (Agr Eng) '81, MSc '84. is working on a water resources agricultural engineering development project in Tanzania. He paid a brief visit to Macdonald in August this year.

GILLES PELLETIER, BSc (Agr Eng) '84, has been appointed service engineer with Deere and Company, Grimsby, Ontario.

DANIEL TASSE, BSc (Agr) '85, a native of Russell County in Ontario, was named red meat advisor for the districts of Cochrane North, Cochrane South, Timiskaming and Nipissing, working from the New Liskeard office of the Ontario Ministry of Agriculture and Food. He has worked for OMAF as a soils and crops contact and as a farm management specialist.

deceased

GORDON WOOD, BSA '11, of Beamsville, Ont., in early July, 1985. Mr. Wood was a member of the first graduating class. (For information on Mr. Wood written on the occasion of his 100th birthday, see *Macdonald Journal,* November 1984.)

ERNEST L. EATON, MSA '25, of Windsor, N.S. Mr. Eaton was a past-president of the Canadian Seed Growers' Association.

JEAN (McCRIMMON) REEVES, BHS '25 at Burlington, Ont., on May 14, 1985.

FREDERICK G. McLEOD; BSA '30, at Saint John, N.B., on June 3, 1985.

DR. JAMES C. WOODWARD, BSA '30, at Ottawa, Ont., on August 22, 1985.

ESTELLA M. (DAY) CAUGHEY, Dip PE '32, of St. Andrews, N.B., on June 11, 1984.

LOUIS D.E. HALLEY, BSc (Agr) '45. No further information.

DUNCAN EARLE MacRAE, BSc (Agr) '50, of Regina, Sask.

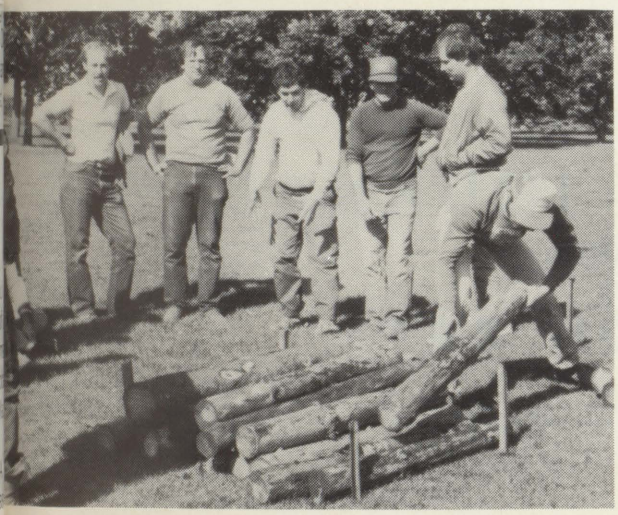
VERNON V. MELDRUM, BSc (Agr) '50. No further information.

PAUL M. TRACEY, BSc (Agr) '50, at Saint John, N.B., on April 18, 1985.

Mac Woodsmen Celebrate 25th Anniversary

John Watson welcomed his dad Bob Watson and some 80 graduates from he Maritimes, Ontario, and Quebec. "The day was a total success," he said. There were nine teams with six competitors, seven team events, and six single events.

Swede sawing: Ray Perron and Al MacLeod, Cindy Murray, Paul Brentan, Ed Doyle, and Dave MacKenzie. Pay Perron was the winner in Pulp for Distance and the Maritime Grits won the chug-a-lug contest.



Pulp pile by Gary Hamilton watched closely by Harry van ler Linden, Robert Moore, Brian Ouimet, Phil Parlee, and Arnold Bayers. Harry van der Linden won the Chain Saw.

Getting ready for the water boil: Ann Louise Carson, John Watson, Marina Templeton, Pam Richardson, Gary Hamilton, Neil Richardson, Jack Sadler, and Phil Gasser.

No winner in single crosscut; the saw broke! but Pierre Yvan Gasser gives it a good try cheered on by Jacinthe Odette, Randy Trumder, Scot Wile, Lois Fowler, Kelley Allen, Gary Hamilton, and Rudy Erfie.

Planning strategy: Mike Ouimet, Angus MacKinnon, Dan Ouimet, Susan Lussier, Martha Robinson, and Peter Enright.

MACDONALD JOURNAL

A QUARTERLY PUBLICATION

SUBSCRIPTION RATE

Canada — One year $6.00 ☐

Outside Canada — One year $10.00 ☐

Subscriptions
MACDONALD JOURNAL
Box 284
Macdonald College
21,111 Lakeshore Road
Ste. Anne de Bellevue, Que.
Canada H9X 1C0

Please enter my subscription for.....years.

Name.....

Address.....

.....

.....